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COMMERCIAL FISHERIES ABSTRACTS

UNITED STATES DEPARTMENT OF THE INTERIOR
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A description of the numbering system is contained in FISHERY LEAFLET No. 232: "FISHERY TECHNOLOGICAL ABSTRACT CARD SYSTEM," by Maurice E. Stansby, K. L. Osterhaug, and F. Bruce Sanford. The Leaflet is obtainable free from this Bureau.

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<p>0.112 A NEW APPROACH TO UNDERWATER STROBE LIGHT DESIGN</p> <p>Blanchard, F. A., Jr., and W. L. Dalton, Jr. (Department of Electrical Engineering, University of New Hampshire, Durham) Marine Technology Journal 3, No. 1, 79-82 (January 1969)</p> <p>Improvements in the photographic techniques and instruments used for deep-sea explorations are always needed. Photographic instruments, like other ocean equipment, are adversely affected by leaks, corrosion, and excess weight. The weight is largely due to the heavy, thick-walled enclosures normally used to protect the instruments' delicate components from the effects of deep-sea pressures. This paper describes a new approach to the design of an electronic light source for use in underwater photography.</p> <p>The newness of the design lies more in the strobe's housing than in the components and the circuitry used, although only those that could operate normally at pressures of up to 10,000 p.s.i. were incorporated in the system. All the electronic components except the flashtube are housed in a plastic container wherein all free space is completely filled with an insulating fluid. When they are immersed in water, they are subjected to the ambient pressure of the water surrounding the instrument. The system has been successfully tested at a hydrostatic pressure of 10,000 p.s.i., the pressure occurring at depths of about 20,000 ft.</p> <p>(over)</p> <p>COMMERCIAL FISHERIES ABSTRACTS VOL 22 NO 4 PAGE 1 UNITED STATES DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE</p> <p>ABSTRACTER: L. Baldwin</p>	<p>0.5 LOW TEMPERATURE GROWTH OF SALMONELLA</p> <p>Matches, Jack R., and J. Liston (Food Science, College of Fisheries, University of Washington, Seattle 98105) Journal of Food Science 33, No. 6, 641-645 (November-December 1968)</p> <p>Salmonella organisms cause infections in man and in many species of animals. They can grow and survive in infected foods. Normally they have an optimum temperature for growth of 37° C., but they can survive and even increase at much lower temperatures. Accordingly, these organisms could be of serious public health significance in refrigerated foods stored for long periods. The purpose of this study was to determine the lowest temperature that permitted growth of salmonellae on agar and in broth.</p> <p>Salmonella serotypes were grown on an agar surface in a temperature-gradient incubator and in broth in a polythermostat over a temperature range of 1.1° to 12.3° C. The minimum growth temperature and the temperature at which the number of viable cells declined were determined over this range.</p> <p>Minimum growth temperatures after 7 days' incubation for seven serotypes (<i>S. heidelberg</i>, <i>S. derby</i>, <i>S. typhimurium</i>, <i>S. aertrycke</i>, <i>S. montevideo</i>, <i>S. newport</i>, and <i>S. thompson</i>) grown on the surface of agar ranged from 5.5° to 6.8° C.</p> <p>The pattern of survival or growth in broth of <i>S. derby</i>, <i>S. heidelberg</i>, and <i>S. typhimurium</i> was followed over the temperature range of 1.1° to 12.3° C. The (over)</p> <p>COMMERCIAL FISHERIES ABSTRACTS VOL 22 NO 4 PAGE 1 UNITED STATES DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE</p> <p>ABSTRACTER: F. T. Piskur</p>
<p>0.12 REDUCING DRIP LOSS IN FISH FILLETS</p> <p>Spinelli, John, and Dave Weig (Bureau of Commercial Fisheries, Technological Laboratory, Seattle, Washington) Canner/Packer 137, No. 12, 28-29 (November 1968)</p> <p>Free fluid, or drip, in prepackaged fish fillets detracts from the appearance of the product. It makes for unsightly liquid that seeps through the package and leaves a decided odor on the hands of anyone holding the package. And it represents an economic loss, since shrinkage in the product due to drip loss must be borne by the seller, the distributor, or the consumer.</p> <p>Drip in fresh or thawed fillets can be controlled by the addition of small amounts of sodium tripolyphosphate (TPP) either before the fillets are distributed or before they are frozen. The TPP causes modification of the surface layer of protein so that the escape of fluid from the interior of the fillet and the resulting drip are reduced. If properly applied, TPP does not affect the taste of the fish; on the contrary, the texture characteristics of TPP-treated fish remain more normal during both fresh and frozen storage than do those of untreated fish.</p> <p>Although TPP and similar phosphates have long been used as food-modifying agents in the meat and dairy industries, their use in the fish industry has largely been neglected because of the difficulties of proper application. Fillets (over)</p> <p>COMMERCIAL FISHERIES ABSTRACTS VOL 22 NO 4 PAGE 1 UNITED STATES DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE</p> <p>ABSTRACTER: L. Baldwin</p>	<p>0.6 SURFACE ACTIVE AGENTS EFFECTS ON DRYING CHARACTERISTICS OF MODEL FOOD SYSTEMS</p> <p>Salas, F., and T. P. Labuza (Department of Nutrition and Food Science, Massachusetts Institute of Technology, Cambridge, Massachusetts 02139) Food Technology 22, No. 12, 80-84 (December 1968)</p> <p>Although air dehydration has been used extensively for preserving foods, very little is known about the physical and chemical aspects of water movement during the drying. Such information would be useful in developing better basic process designs for dehydrating foods. Certain earlier studies by other workers suggested that capillarity is important as the mechanism of moisture transfer during drying. The purpose of this study was to determine the extent to which capillarity is important during dehydration of model food systems.</p> <p>The model food system was prepared by combining cellulose, oil, and water. The effects of surface-active agents on the air-drying characteristics of this model were studied. The following surfactants were used: (1) Tween 20: polyoxyethylene (20) sorbitan monolaurate, nonionic, water soluble; (2) Span 20: Sorbitan monolaurate, nonionic, lipid soluble; and (3) G-263: N-cetyl-N-ethyl morpholinium ethosulfate, ionic, water soluble. Drying rate and shrinkage of the model systems with added surfactants were measured as a function of moisture content. The drying rate pattern consisted of an initial constant rate period followed by two falling periods. The nonionic surfactive agents (Tween 20 and Span (over)</p> <p>COMMERCIAL FISHERIES ABSTRACTS VOL 22 NO 4 PAGE 1 UNITED STATES DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE</p> <p>ABSTRACTER: F. T. Piskur</p>

0.12 (Cross Reference: 3.19)

can be dipped in an appropriate TPP solution, or they can be sprayed with it. But dipping has one major disadvantage: the dip tank rapidly becomes contaminated with dissolved proteins, bacteria, and particles of fish, so the solution must be changed periodically. Spraying has no such disadvantage if it is done right.

To that end, the authors designed and tested a machine that can spray TPP solutions onto fillets. The machine has five adjustable spray nozzles, two above and three below the conveyor belt. Pressure from the spray heads can be varied from 0 to 100 pounds per square inch. The speed of the belt can also be varied. In operation, the runoff solution is discarded. A filter-recycling system could be incorporated in the machine to avoid the discard, but, since the solution costs only from 6 cents to 8 cents per 100 lb. of fillets, depending on the concentration of TPP, such a system hardly seems economical.

This laboratory model was tested on fresh refrigerated fillets by spraying them with solutions containing from 7.5 to 10 percent TPP plus 2 percent salt. Sole, ocean perch, cod, and halibut steaks that had been sprayed lost no more than 0.5-1.0 percent drip during their effective refrigerated shelf life; untreated fish lost from 3-6 percent drip during the same storage period.

When the machine is not being used for spraying TPP solutions, it can be used as a glazing machine. The glazes it puts on fish are notably uniform. The amount of glaze can be controlled simply by varying nozzle types, nozzle pressures, or belt speeds.

The machine has not been tested on fillets to be frozen.

[1 schematic, 2 pictures, 6 references]

0.112 (Cross Reference: 9.11)

The strobe's weight in water is 2 lb., significantly less than that of conventional strobes. The use of plastic and other nonmetallic materials eliminates leakage and reduces corrosion to a minimum. [9 figures, 3 references]

0.6 (Cross Reference: 3.6)

20) at high concentration decreased the drying rate during the initial constant rate period and shortened the length of the period; also, shrinkage was less. These effects apparently were related to the decrease in liquid surface tension of the water in the pores by the addition of surfactant.

On the basis of the results obtained, the authors suggest that the addition of edible surfactants to foods would be of no use in increasing the drying rate. The technique might be useful, however, for drying ground slurried materials; for example, dried food cakes of proteinaceous origin prepared for developing countries could be made porous during drying and thus would rehydrate rapidly. [6 figures, 3 tables, 23 references]

0.5 (Cross References: 2.05, 8.8)

minimum growth temperature for *S. heidelberg* after 19 days' incubation was 5.3° C. The minimum growth temperature for the same period for *S. typhimurium* was 6.2° C., and for *S. derby* was 6.9° C. There was a decrease in minimum growth temperature during extended storage. These results show that *Salmonella* can grow at temperatures below 6° C. after a relatively long period of time. Therefore, good temperature control is important for storing foodstuffs under refrigeration for extended periods; the authors recommended food storage temperatures below 5° C. at all times. [2 tables, 4 figures, 8 references]

1.00	RESOURCES OF THE SEA. PART TWO: FOOD RESOURCES OF THE SEA BEYOND THE CONTINENTAL SHELF EXCLUDING FISH	Idyll, C. P. (Institute of Marine Sciences, University of Miami, Coral Gables, Florida) United Nations Economic and Social Council, 44th session, Report of the Secretary-General. Document E/4449/Add.2 (February 7, 1968) 145 pp.	Most sea life is concentrated in the shallow, sunlit waters of the Continental Shelf. However, many forms inhabit the 97 percent of the ocean that lies beyond the Continental Shelf. This report examines the oceanic plants and animals, except fish, that are potentially useful as food for land animals.	I. The Biological Environment and Primary Production in the Sea.--The characteristics of the sea that give rise to variations in the productivity of different ocean areas, the significance of an increasing number of links in the food chain, and the total amounts of organic material in the sea at various trophic levels are discussed.	II. The Harvest of Plankton.--By far the bulk of oceanic life consists of plant plankton. Yet, because they are too small to be harvested practically, sometimes have toxic qualities, and usually have harsh shells, their potential as human food is poor. Animal plankton, in contrast, are nutritive and palatable; the problem, again, is harvesting. Several suggested harvesters are mentioned. (over)	COMMERCIAL FISHERIES ABSTRACTS VOL 22 NO 4 PAGE 3 UNITED STATES DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE	ABSTRACTER: L. Baldwin
1.0112	JAPANESE, SOVIET, AND SOUTH KOREAN FISHERIES OFF ALASKA - DEVELOPMENT AND HISTORY THROUGH 1966	Chitwood, Philip E. (Bureau of Commercial Fisheries, Office of Enforcement and Surveillance, Juneau, Alaska 99801) Circular 310, 34 pp. (January 1969) (Bureau of Commercial Fisheries, U.S. Fish and Wildlife Service, Washington, D.C. 20240)	In less than 30 years (excluding the 1942-1951 World War II period), the Japanese and Soviet fishing fleets have spread across the Continental Shelf from the Central Bering Sea to British Columbia. Equipped with some of the world's most modern gear and vessels, they operate the year round off Alaska, catching over 3 billion pounds of fish, shellfish, and whales annually. The monthly average of their combined vessels numbers from about 370 in June to somewhat fewer than 70 in November.	The Japanese fish for groundfish (to be used both for reduction to fish meal and oil and for freezing as human food), king crab, shrimp, salmon, and whales. The peak years for their catches were 1955, 64,100,000 salmon; 1962, 440,000 tons of groundfish; 1963, 34,775 tons of shrimp; 1964, 5,900,000 king crabs; and 1966, 6,464 whales. The Soviets fish for flounder, herring, Pacific ocean perch, king crab, shrimp, whales, "halibut," and sablefish. Few statistics are available but some of the Soviets' reportedly peak years were 1961, 3,400,000 king crabs; 1964, 150,000-200,000 tons of herring; 1965, 420,000 tons of Pacific ocean perch; and 1966, 100,000 tons of flounder, 12,000 tons of shrimp, and 12,267 whales. (over)		COMMERCIAL FISHERIES ABSTRACTS VOL 22 NO 4 PAGE 3 UNITED STATES DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE	ABSTRACTER: L. Baldwin
1.25	THE AMERICAN SHAD	Cheek, Randall P. (Bureau of Commercial Fisheries Biological Laboratory, Beaufort, North Carolina 28516) Fishery Leaflet 614, 13 pp. (August 1968) (Bureau of Commercial Fisheries, U.S. Fish and Wildlife Service, Washington, D.C. 20240)	The American shad (<i>Alosa sapidissima</i> Wilson), the largest member of the herring family in North America, is found along the east coast from the St. Lawrence River, Canada, to the St. Johns River, Florida, and along the west coast from Cook Inlet, Alaska, to the Mexican border. In these regions, it occurs in sufficient quantities to support fisheries of great value. This article deals mainly with the biological characteristics of the shad, but it also briefly surveys the shad commercial fishery.	The peak year for harvesting east coast shad was 1896, when more than 50 million pounds was landed. Since then, however, landings have decreased until today it ranks fortieth in weight and twenty-eighth in value in the total U.S. catch. The annual east coast catch today is about 10 million pounds.	On the Pacific Coast, the commercial fishery began in 1890, some 20 years after about 12,000 young east coast shad were first brought in by train and planted in the Sacramento and the Columbia Rivers. The catch reached 7 million pounds in 1915, but today it amounts to only about 1.5 million pounds. The gear (over)	COMMERCIAL FISHERIES ABSTRACTS VOL 22 NO 4 PAGE 3 UNITED STATES DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE	ABSTRACTER: L. Baldwin
2.02	THE EFFECT OF TEMPERATURE ON CATALYTIC AND REGULATORY FUNCTIONS OF PYRUVATE KINASES OF THE RAINBOW TROUT AND THE ANTARCTIC FISH TREMATOMUS BERNACCHII	Somero, G. N., and P. W. Hochachka (Department of Zoology, University of British Columbia, Vancouver 8, B.C.) Biochemical Journal 110, No. 3, 395-400 (December 1968)	Sharp and frequently differential effects of temperature on the catalytic and regulatory properties of mammalian and bacterial enzymes have been observed. This phenomenon, however, is poorly understood. In certain systems, at low and usually physiological concentrations of substrate, enzymatic activity may be greater at low temperatures than at high temperatures. The overall purpose of this study was to examine the action of temperature on the catalytic and regulatory functions of certain poikilothermic enzymes involved in glycolysis and gluconeogenesis in fishes. This particular paper reports on the study of pyruvate kinases from the temperate-zone rainbow trout (<i>Salmo gairdneri</i>) and the Antarctic fish <i>Trematomus bernacchii</i> .	The K_m value (a measurement of enzyme-substrate affinity) of pyruvate kinases for the substrate phosphoenolpyruvate is temperature-independent and is lowest at temperatures that closely coincide with the habitat temperatures of the two fishes. Two regulatory functions of the enzyme, feedforward activation by fructose diphosphate and feedback inhibition by ATP (adenosine triphosphate) on back of card. (over)		COMMERCIAL FISHERIES ABSTRACTS VOL 22 NO 4 PAGE 3 UNITED STATES DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE	ABSTRACTER: F. T. Piskur

1.0112 (Cross References: 1.0145, 1.0154, 1.0155)

Chronological Highlights of Asian Fishing Activities off Alaska

Year	Japanese	Soviet	South Korean
1930	King crab fishing begun in Eastern Bering Sea.		
1933	Trawling for groundfish (for making fish meal & oil) begun.		
1940	Freezing of groundfish catch for human consumption begun.		
1952	High-seas salmon fishing begun off the Aleutians.		
1959	Whaling begun in Aleutian area.	Fishing for king crab and flounder begun in E. Bering; whaling begun off Aleutians.	
1960	Longlining for sablefish begun in Central and Eastern Bering Sea.	Fishing for herring begun in Central Bering; for ocean perch in Central & Eastern Bering.	
1961	Shrimping begun north of the Pribilofs.		
1963	Longlining for halibut begun in Eastern Bering.	Shrimping begun in Central Bering.	
1966		Exploratory trawling for groundfish & high-seas gill netting of salmon begun in Gulf, Bering, & Aleutian area.	

[8 tables, 19 figures, 43 photographs, 44 references]

1.00 (Cross References: 9.16, 9.17)

III. The Squids.--The distribution and nutritive value of squids and the location and character of squid fisheries are discussed. The factors that hamper expansion of squid fisheries (prejudice against them as human food; difficulties of capturing them; and ignorance of their biology, distribution, and ecology) are examined.

IV. The Harvest of Whales.--The dozen-odd species of whales that have been hunted commercially are described in detail; catches, fishing areas and nations, products, and quotas are tabulated. Ending the section is a review of the International Whaling Commission's efforts to halt critical depletion of the world's whale stocks.

V. Harvest of Seals, Sea Lions and Walruses.--About 20 species of seals, sea lions, and walruses have been exploited commercially. The physical characteristics of each are described, their commercial value is reported, and their future potential is analyzed. Restorative management of the herds is urged.

VI. Aquaculture - Its Promise and Limitations.--Farming the open sea in the sense of full control of the life history of marine animals (with selective breeding, specialized feedings, and the elimination of predators) is highly unlikely. But increasing productivity by such farming techniques as inducing artificial upwellings--or fertilizing--is infinitely possible. Several systems based on nuclear technology, their cost-benefits ratio, and their operation and maintenance are theorized. Political and socio-economic problems are considered.

VII. Research Required for Exploitation of the Open Sea.--Among the studies that must be made before man can fully utilize the resources of the open sea are those dealing with factors that determine the rate of survival of marine animals, ocean ecology (the character of the sea's water masses and life forms, along with improved instruments), and regulation of the marine fisheries. [16 tables]

2.02 (Cross References: 0.38, 9.13)

triphosphate), are temperature-independent. The pyruvate kinase-adenosine diphosphate interaction is also temperature-independent.

The authors concluded that enzyme-substrate and enzyme-modulator interactions are important factors in short-term and evolutionary adaptations by poikilotherms to changes in temperature. The regulatory functions of an enzyme appear to be unchanged over the range of temperatures experienced by the organism in nature. [5 figures, 2 tables, 36 references]

[Abstracter: L. Baldwin]

The committee on salmonella of the division of biology and agriculture, National Academy of Science-National Research Council, under contract to the U.S. Department of Agriculture and the Food and Drug Administration, has prepared a 330-page report entitled "An Evaluation of the Salmonella Problem." Among its recommendations are several covering governmental programs to control salmonella contamination of feeds and feed ingredients, including antibiotic additives.

Anonymous Feedstuffs 41, No. 2, 6, 70 (January 11, 1969)

STUDY OUTLINES SALMONELLOSIS CONTROL

2.05 (Cross References: 6.55, 8.8, 9.3)

1.25

used to catch the fish has changed little with time--only the techniques and materials have changed. The principal means of catching are pound nets and stake gill nets, set in estuaries and bays; drift gill nets, set in the lower reaches of rivers; seines, traps, gill nets, and bow nets, used in the narrow headwaters of streams; and, to a very limited extent, fish wheels, used in a few streams.

The decline in catch over the years is probably due to lack of demand rather than to a decrease in the number of available fish. The roe has some commercial demand, and a limited amount of the fish is marketed as fillets, but shad is usually marketed whole and fresh, a method of selling that is not conducive to growth in this era of convenience foods. Thus, future development of the fishery as a source of food fish is largely dependent on development of a wider range of products that will appeal to the consumer. If annual production could be brought back to the levels reached in the 19th century, the commercial value of the catch would exceed \$6,500,000. [17 figures, 12 references]

<p>2.1121</p> <p>EXPERIMENTS IN FISHING WITH SHRIMP TRAWLS -- ON THE STANDARDISATION OF TICKLER CHAIN</p> <p>Deshpande, S. D., and K. N. Kartha (Central Institute of Fisheries Technology Sub-Station, Veraval, India)</p> <p>Fishery Technology 4, No. 2, 62-64 (July 1967) (Central Institute of Fisheries Technology, P.B. No. 1039, Chittoor Road, Ernakulam, Cochín-11, India)</p> <p>In 1962 and 1964, Deshpande et al. discussed the importance of using a tickler chain to increase the number of shrimp caught by beam and otter trawls. In the present paper, they describe an experiment conducted to determine the optimum size of the chain.</p> <p>Three 16-m.-long galvanized iron chains were used in the experiment. The chains' links were 20 mm. x 10 mm. and were made of rod either 3.2 mm., 4.8 mm. or 6.2 mm. in diameter. The chains were so attached to the net that during operation they remained about 0.5 m. ahead of the foot rope. The net was a 13.7-m., two-seam, overhang otter trawl with rectangular otter boards 1.39 m. x 0.63 m.</p> <p>Fishing runs were made from February 28, to March 3, 1966, in the prawn grounds between Madhav and Chorwad (NW. India), where the water ranges in depth between 12 and 16 fathoms and the bottom is soft mud. The chains were dragged in various alternating patterns of about 40 min. and at a speed of 2 knots. During the drags, the speed, the ground fished, and the length of warp paid out were kept as uniform as possible.</p> <p>(over)</p> <p>COMMERCIAL FISHERIES ABSTRACTS VOL. 22 NO. 4 PAGE 5 UNITED STATES DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE</p> <p>ABSTRACTER: L. Baldwin</p>	<p>2.1121</p> <p>FIELD EXPERIMENTS OF 100-FOOT TRAWL NET</p> <p>Taniguchi, Takeo, Shiro Minami, and Yoshio Sumikawa (Shimonoseki University of Fisheries, Shimonoseki, Japan)</p> <p>Bulletin of the Japanese Society of Scientific Fisheries 34, No. 10, 889-894 (October 1968) (In Japanese; summary and figures in English)</p> <p>In a previous report (1968), the authors examined the shooting and hauling operation of a two-piece trawl net having a headrope 100 ft. long. In the present report, they examine the working behavior of the net in order to obtain some effective ideas about the construction of a "unigan" trawl net. The results are summarized below.</p> <ol style="list-style-type: none"> 1. The gape height (HNM) of the 100-ft. net can be expressed as a fractional function of the towing speed (V): $HNM = 2.2/V^{1.5}$. 2. The tension of the warp (TWP) at the boardside depends on both the towing speed and the length of the warp (LWP): $TWP = V^{0.9}(1 + 0.0003 LWP)$. 3. The shape of the warp curves sharply downward when the towing speed is very slow. But as the towing speed increases, the curve becomes less severe, approaching a straight line when the towing speed exceeds 1.5-1.75 m/sec. <p>(over)</p> <p>COMMERCIAL FISHERIES ABSTRACTS VOL. 22 NO. 4 PAGE 5 UNITED STATES DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE</p> <p>ABSTRACTER: L. Baldwin</p>
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<p>2.1121</p> <p>ON THE RELATIVE EFFICIENCY OF DIFFERENT SHAPED OTTER BOARDS</p> <p>Mukundan, M., A. V. V. Satyanarayana, and H. Krishna Iyer (Central Institute of Fisheries Technology, Craft and Gear Wing, Cochín-5, India)</p> <p>Fishery Technology 4, No. 2, 53-61 (July 1967) (Central Institute of Fisheries Technology, P.B. No. 1039, Chittoor Road, Ernakulam, Cochín-11, India)</p> <p>Size, shape, rigging, and method of attachment of otter boards have all received the attention of gear technologists. The hydrodynamic properties of flat rectangular boards, their efficiency as a function of the method of bridle attachment, and their efficiency in terms of the height-to-base ratio; the efficiency of oval otter boards; and the efficiency of doors having a hydrofoil cross-section have all been investigated in test tunnels or tanks. The present authors report on the efficiency of three different types of board under actual fishing conditions.</p> <p>Flat rectangular otter boards, horizontal curved otter boards, and oval single-slitted otter boards were tested. The same net was used with the three types of boards. Hauls were made with each type at 60-m., 80-m., and 110-m. depths and at towing speeds of 2 and 2.5 knots. During each haul, the horizontal spread (measured by the method of Ben-yami, 1959, and Deshpande, 1960) and the tension in the warps (estimated by the method of Satyanarayana and Nair, 1965) were recorded. The horizontal openings of the boards and the towing resistance on the warps were the indices of efficiency.</p> <p>(over)</p> <p>COMMERCIAL FISHERIES ABSTRACTS VOL. 22 NO. 4 PAGE 5 UNITED STATES DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE</p> <p>ABSTRACTER: L. Baldwin</p>	<p>2.1124</p> <p>A FLOATING TRAP NET FOR USE IN RESERVOIRS</p> <p>Ackerman, Gary (Iowa State Conservation Commission, 206 Seventh Street SW, Independence 50644), and Marvin F. Boussu (Bureau of Commercial Fisheries Exploratory Fishing and Gear Research Base, Ann Arbor, Michigan 48103)</p> <p>Commercial Fisheries Review 30, No. 12, 62-64 (December 1968) (Separate No. 831)</p> <p>The net described here was designed for a commercial fisherman. Essentially it is a small trap net with a hoop net for the crib section. A construction diagram and lists of its pertinent features are on the back of the card.</p> <p>Because the net was designed primarily to catch bigmouth buffalo, it is floated on the surface. However, it could be fished on the bottom by changing the float-to-lead ratio. One man in a small boat can set, move, and fish the net. He simply fastens the tag end of the lead to shore, stretches the lead and net out longitudinally, anchors the crib, and then anchors the wings in position. Because anchors instead of stakes are used to hold the net in place and because only the pot is raised when fish are removed, use of the gear is easy and economical.</p> <p>Tests in two reservoirs have showed that the net has great potential as commercial gear, and that it is highly selective for bigmouth buffalo.</p> <p>The authors do not recommend that the net as now rigged be set in waters deeper than 30 ft., for the longer anchor lines required at the greater depths (to prevent disfigurement of the net or submerging of the float lines) would probably necessitate more floats' being attached at the wind and lead tips) and on crib section. They suggest that baiting might improve the catch rate, especially</p> <p>(over)</p> <p>COMMERCIAL FISHERIES ABSTRACTS VOL. 22 NO. 4 PAGE 5 UNITED STATES DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE</p> <p>ABSTRACTER: L. Baldwin</p>
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2.1121

4. The working depth (D) of the otter board can be expressed by the following empirical formula: $D = 27 e^{0.0063LWP} V^{-1.5}$
5. Regardless of the towing speed, the working depth of the net is about the same as that of the otter board. Thus the authors assumed that the shape of the sweep line during towing is a horizontal straight line parallel to the seabed. [6 figures, 17 references]

2.1124

when the net is used for openwater sets. For States seeking a replacement for the gill net, this net may be a partial answer, [2 figures, 1 table]

Construction materials:
Webbing - No. 18 nylon thread
Lines - 1½ in. braided nylon
Plastic floats - 3 x 4 in.
Leads - No. 6
Oak hoops - 7-ft. diameter

The diagram illustrates a Floating Trap Net with the following labeled parts:

- Wing (40 ft.)
- Entrance to heart section (18 ft. square)
- Floats (7-ft. hoops, 2½ ft. apart)
- Throats
- Brailing hole
- Double Crib section hoop (about 17 ft.)
- Heart section (30 ft.)
- Leads
- Lead (200 ft.)
- Wire (40 ft.)
- 18 ft. (two vertical dimensions)

Other dimensions:
Mesh size - 7-in. stretch measure throughout
Crib anchor rope - 100 ft. long
Wing anchor ropes - 50 ft. long (yoked about 30 ft. from anchor, with one line leading to float line and one to bottom line)

Floating Trap Net

2.1121

Results of the experiment are summarized in the table below.

Chain details		Catch details			
Dia. size mm.	Weight kg.	Total catch		Composition of catch	
		Prawns	Fish	Prawns	Fish
3.2	6.3	No. 339	No. 3,096	Percent 9.9	Percent 90.1
		545	3,137	12.1	87.9
6.2	12.3	289	3,116	8.5	91.5

From these results, the authors assume that the weight of the 6.2-mm. chain reduced the horizontal spread of the net more than the two lighter chains did. They conclude that the 4.8 mm. chain, when used with a 13.7 m. two-seam shrimp trawl, gives optimum results without affecting the performance of the gear. [1 table, 6 references]

2.1121

The horizontal spread of the curved boards was somewhat higher than that of the other two pairs of boards. The variation between other boards, towing speeds, and scope-ratios were highly significant at the 0.1-percent level. However, the variation between replicates was not, indicating that fishing conditions were somewhat constant during the experiments. Among the first-order interactions, only speed x scope-ratio was significant (1-percent level). None of the second-order interactions were significant at the 5-percent level.

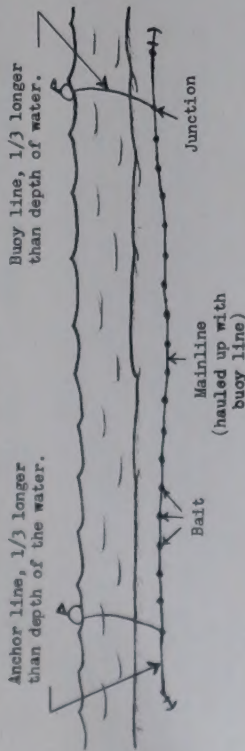
To determine which of the three otter boards gave the maximum horizontal opening, the authors examined the openings given under each scope-ratio and each towing speed separately. The variation in spread between other boards was highly significant except at a scope-ratio of 20/110 and a speed of 2.5 knots. A comparison of their means revealed that the curved board gave a significantly higher (at the 5-percent level) lateral opening than the other two gave.

In general, the oval single-slitted otter board offered the least towing resistance; the curved board offered the most. The variation in tension between the three boards, between speeds, and between replicates was not significant at the 0.1-percent level. The first-order interaction scope-ratio x speed showed a highly significant variation at the 0.1-percent level. The high interacting effect of speed and scope-ratio may have caused the highly significant second-order interaction between other boards x scope-ratio x speed. [3 figures, 7 tables, 18 references]

<div data-bbox="75 21 151 1056"> <div>2.1128</div> <div>EXPERIMENTAL PRAWN TRAP FISHING</div> <div>DECEMBER 1, 1967 TO MARCH 22, 1968</div> </div> <div data-bbox="151 21 740 1056"> <div>Yates, A. N.</div> <div>Circular 87, 29 pp. (December 1968) (Fisheries Research Board of Canada)</div> <p>Numerous inquiries about the construction of prawn traps led the author to test the suitability and efficiency of various types of trap material.</p> <p>Eighty-nine traps of various sizes and shapes were tested. Because triangular and cylindrical traps are difficult to stow, most of the experimental traps were oblong. They were made of metal, burlap over netting, 5/16- or 3/8-in. unsanded plywood, cedar lath, 3/64-in. fiberglass, or 1/16-in. plastic sheeting. Frames were made from 3/8-in. iron rod or from 1-in. x 2-in. or 1-in. x 1-in. fir or yellow cedar. The tunnels were of nylon netting (1-1/4 to 1-1/2 in. stretched mesh) or polypropylene netting that tapered to the tunnel entrances or the tunnel rings (2-3 in. in diameter). Some of the traps had metal rings that were reduced from 3 in. to 2-3/4, 2-1/2, 2-1/4, or 2 in. by smaller rings wired inside. One trap had 3-in. lips welded to the inside of the tunnels. The fiberglass and plastic tunnels tapered to rectangular entrances of about 2 in. x 2 in. Half-inch-diameter holes were made in the tunnels and bottom section of fiberglass and sheet-plastic traps to allow for drainage.</p> <p>Except for two galvanized traps, which were painted black, all the galvanized traps and the plywood traps were unpainted. All the fiberglass traps were painted</p> <div> <div>COMMERCIAL FISHERIES ABSTRACTS</div> <div>VOL 22 NO 4 PAGE 7</div> <div>UNITED STATES DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE</div> </div> <div> <div>ABSTRACTER:</div> <div>L. Baldwin</div> </div> </div>	<div data-bbox="75 1056 151 2134"> <div>2.1119</div> <div>COMBATING THE ICING-UP HAZARD IN TRAWLERS</div> </div> <div data-bbox="151 1056 740 2134"> <div>Anonymous</div> <div>Canadian Fisherman 56, No. 1, 30 (January 1969)</div> <p>Three unrelated types of equipment have been developed to reduce the hazards of icing.</p> <p>The first is a pneumatic device operated by compressed air. Essentially, the system consists of sets of neoprene rubber overshoes and facings that are laid over such parts of the ship's superstructure as masts, mast stays, and bridge front. When ice forms on the overshoes and facings, compressed air at a pressure of about 15 p.s.i. is pumped into them; they then inflate and crack the ice. Durling trials in a test chamber, up to 9 in. of ice was cracked and removed at temperatures of -15° C. Such temperatures are said to be equivalent to the severest possible Arctic conditions trawlers will undergo. Moreover, the ice in the test chamber is appreciably stronger than the ice formed from ocean brine. In practice, up to 6 in. of ice has been cracked several times.</p> <p>The equipment is easily installed--it can be fitted to a trawler's mast stay in about an hour. Also, it can be demounted and stowed away aboard or ashore during the summer months. Equipment sufficient to protect a modern side trawler costs about \$9,100; equipment for a freezer stern trawler costs about \$26,000. Similar equipment has been designed for the radar scanner and for deck-stowed inflatable life rafts.</p> <div> <div>COMMERCIAL FISHERIES ABSTRACTS</div> <div>VOL 22 NO. 4 PAGE 7</div> <div>UNITED STATES DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE</div> </div> <div> <div>ABSTRACTER:</div> <div>L. Baldwin</div> </div> </div>
<div data-bbox="740 21 816 1056"> <div>2.1129</div> <div>A TROTLINE FOR BLUE CRABS</div> </div> <div data-bbox="816 21 1383 1056"> <div>Floyd, Hilton M. (Bureau of Commercial Fisheries Exploratory Fishing and Gear Research Base, Pascagoula, Mississippi 39567)</div> <div>Fishery Leaflet 616, 5 pp. (December 1968) (Bureau of Commercial Fisheries, U.S. Fish and Wildlife Service, Washington, D.C. 20240)</div> <p>Although most fishermen in the Southeastern United States use traps to catch blue crabs, some use trotlines. The conventional bait is very tough--bullnose, tripe, skate, stingray, or shark. This paper describes a method of rigging a trotline with soft, small pieces of scrap meat or trash fish that can be as effective as the more conventional method.</p> <p>The materials needed for a trotline about 1,000 ft. long are: (1) 1,200 ft. of nylon rope (3/16 in. in diameter); (2) two anchors (scrap iron, cinder blocks, or rocks may be used; the style and weight will depend on the type of bottom and the speed of the current); (3) two buoys (plastic jugs, discarded life preservers, or clusters of net floats may be used); and (4) 175 pieces of No. 15 thread netting, 10 in. square, 2-in. stretched mesh (preferably nylon; discarded trawl, seine, or trap netting may be used, since it will undergo little strain). The author emphasizes that the size of all these materials may be altered to suit individual conditions.</p> <p>The bait is prepared by placing 1/2 to 3/4 lb. of scrap meat or fish in the center of each 10-in. square of netting, gathering the outer edges of the netting</p> <div> <div>COMMERCIAL FISHERIES ABSTRACTS</div> <div>VOL 22 NO. 4 PAGE 7</div> <div>UNITED STATES DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE</div> </div> <div> <div>ABSTRACTER:</div> <div>L. Baldwin</div> </div> </div>	<div data-bbox="740 1056 816 2134"> <div>2.112</div> <div>AQUASCAN CAMERA</div> </div> <div data-bbox="816 1056 1383 2134"> <div>McNeil, Gomer T. (Photogrammetry, Inc., Rockville, Maryland)</div> <div>Marine Technology Journal 3, No. 1, 101-106 (January 1969)</div> <p>Described is a panoramic camera for producing high-quality photographs under water. Its dual-lens system consists of a dome window and a rotating lens. The aperture ratio ranges from 1:2.8 to 1:11. Based on a circle of confusion of 25 microns and an aperture ratio of 1:2.8, the depth of field extends from a radius of 2.8 to 20.7 meters. If the circle of confusion is increased to 50 microns, the depth of field extends from 2.0 meters to infinity.</p> <p>The lens is fix-focused at a nodal object distance of 5 meters; the nodal image distance is 25 millimeters. Shutter speed is fixed at 1/100 second. Resolution is 75 lines per millimeter, AWAR, on Pan X film. The camera will hold up to 150 feet of 4 mil base 35 mm. film, which will yield 825 exposures. To prevent smearing of the image on the film and the resulting loss of resolution when the camera is mounted on an underwater vehicle, a device is installed in the camera to compensate for image motion. This IMC (image motion compensation) device moves the film in synchronization with the image of the ocean bottom.</p> <div> <div>COMMERCIAL FISHERIES ABSTRACTS</div> <div>VOL 22 NO. 4 PAGE 7</div> <div>UNITED STATES DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE</div> </div> <div> <div>ABSTRACTER:</div> <div>L. Baldwin</div> </div> </div>

2.1129

Anchor line, 1/3 longer than depth of the water.



to form a sack, and twisting. These twisted nettings are inserted in slipknots. made at 6-ft. intervals along the mainline. The slipknots are then drawn tight. The trotline described above may be fished at most depths and on various types of bottom where blue crab live. It can be set from almost any small craft. If the current is noticeably strong, it should be set parallel to the current to prevent the anchor's being dragged while crabs that are feeding on the bait are being removed.

The fisherman running the trotline may allow the boat to drift while he slides the line through one hand and dip nets the crabs with the other. He may fish the gear by passing the line over a roller extended over the side of the boat, using one hand to operate the boat and the other to dip net the crabs. Or, he may suspend a basket below the roller to catch the crabs as they drop off.

In areas where the concentration of crabs is great, the line should be run continually--that is, as soon as one run is completed, another should be started. If the crabs are kept wet and in the shade, their quality will be unaffected by the continuing operation.

2.1128 (Cross References: 1.85, 2.1474)

green except one, which was left its normal light brown. The traps of plastic sheeting were all black except one, which was green; those of molded plastic were white.

Fishing was conducted from a wooden-hulled gill netter on commercial prawn grounds off the east coast of Vancouver Island. From 10 to 20 of the traps were set at 10-fathom intervals on a longline in such a way that no trap was next to one of the same type. The bait was a chunk of dogfish. Fishing periods, or "soaks," were divided into four categories: (1) 4 hr. or less, (2) 5 to 8 hr., (3) 16 to 20 hr., and (4) 21 hr. and longer; 1,228 lifts were made.

The results show that a shorter set in addition to the overnight set is economically justified. A short day soak yields 13 or 14 oz. per trap; the overnight soak will yield about 15 oz. Since the vessel is already on the fishing grounds, operating costs for the extra soak are small.

In fishing efficiency, the plywood and plastic-covered traps were best, followed by fiberglass, lath, galvanized iron, and burlap. The cost of material for the different traps was as follows: burlap, \$1.75; lath and plywood, \$2.00; metal, \$3.50; fiberglass, \$12.50; plastic sheeting, \$17.00; and molded plastic, \$25.00. All the traps were easily constructed with regular tools except the metal ones, which had to be welded; also, the covers were formed on a sheet metal jig.

As for durability, heavy burlap will last for one season if the covering is over netting and not in direct contact with the metal frame. Lath and plywood traps last about 3 years. The galvanized iron, fiberglass, and plastic traps probably last longer than 3 years, but the author has not determined their exact life yet. All the traps were easily maintained.

[6 tables, 13 figures, 3 references]

2.12 (Cross References: 0.112, 9.11)

The camera is 11.5 inches long and 5 inches in diameter; it has a negative buoyancy of 4 pounds. Within its watertight aluminum housing are two 6-volt d.c. motors (one for metering and film winding and the other for the reciprocal rotation of the scan head and the IMC device) powered by five "C"-sized batteries. The camera has been successfully tested to a water depth of 2,000 feet. [12 figures, 3 references]

2.119

The British trawler Boston Phantom has been granted permission by the Government of Iceland to fish within the Icelandic 12-mile limit to test the system. Also, a sample set has been sent to the Canadian National Research Council for testing. Reportedly, this set has broken all the ice put on it. Following the operational trials, the equipment will be put on the commercial market.

The other two pieces of safety equipment that have been developed are Parafil rope and several notch-type aerials. Both minimize ice attraction and retention. The aerials greatly improve ship-to-shore radiotelephone communications while at the same time eliminating the danger of damage by gale-force winds. They can be installed on all types of craft, including hovercraft and trawlers, and at any suitable place on the ship's structure. Once installed, they are scarcely noticeable, for they need no unsightly wires as part of the fitting.

<div data-bbox="74 1282 103 2102"> <p>2.12 DIRECT ESTIMATION OF A FISH POPULATION ACOUSTICALLY</p> </div> <div data-bbox="118 1131 215 2102"> <p>Cushing, D. H. (Fisheries Laboratory, Ministry of Agriculture, Fisheries and Food, Lowestoft, England) Journal of the Fisheries Research Board of Canada 25, No. 11, 2349-2364 (November 1968)</p> </div> <div data-bbox="230 1175 304 2102"> <p>The authors describe a method of acoustically estimating fish stocks by length-groups. They recorded individual hake down to 350 fathoms off southern Africa on the paper record of an echo sounder.</p> </div> <div data-bbox="319 1153 549 2102"> <p>Three preliminary conditions, often readily achieved with commercial echo sounders, must be defined for acoustic estimation of fish stocks. First, the fish must be identified by capture and the enumeration must be limited to the depth zone in which the fish-capturing gear is effective. Second, the fish must be recorded on echo-sounder paper or in an electronic store as individuals so that they can be counted per unit time or distance in the depth zone delimited by the capturing gear. Third, the transducer must be calibrated and the amplifier monitored so that the signals from the individual fish can be assigned to size-groups and to sampling volume. The output of the transducer and the signal at the amplifier are expressed in energy or in sound pressure.</p> </div> <div data-bbox="563 1153 660 2102"> <p>The stocks of fish are estimated as follows. First, the target strength of a fish is estimated. These measurements are referred to a standard level of energy or of sound pressure. Secondly, from the proper averaging of signals from (over)</p> </div> <div data-bbox="660 1239 697 2123"> <p>COMMERCIAL FISHERIES ABSTRACTS VOL 22 NO 4 PAGE 9 UNITED STATES DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE ABSTRACTER: F. T. Piskur</p> </div>	<div data-bbox="74 237 118 1024"> <p>3.15 IRRADIATION PRESERVATION OF FRESHWATER FISH. ANNUAL REPORT, APRIL 15, 1966 TO APRIL 14, 1967</p> </div> <div data-bbox="133 32 215 1024"> <p>Gralkowski, J. T., N. Kazanas, J. Watz, S. DuCharme, J. A. Emerson, and H. L. Seagran (Bureau of Commercial Fisheries, U.S. Fish and Wildlife Service, Ann Arbor, Michigan)</p> </div> <div data-bbox="215 32 304 1024"> <p>U.S. Atomic Energy Commission, Division of Technical Information, TID-24776, var.p. (December 1966) (Report available from the Clearinghouse for Federal Scientific and Technical Information, National Bureau of Standards, U.S. Department of Commerce, Springfield, Virginia 22151) Price \$3.00</p> </div> <div data-bbox="319 97 371 1024"> <p>This is a report of 1 year's progress on studies to develop methods for irradiation preservation of fresh-water fishery products.</p> </div> <div data-bbox="385 485 415 959"> <p>The report is divided into three parts:</p> </div> <div data-bbox="430 32 593 1024"> <p>Part A, Controlled Atmosphere Studies, deals with the effect of storing irradiated yellow perch fillets in controlled atmospheres (consisting of either 6 or 12 percent carbon dioxide, 1.5 percent oxygen, and the rest nitrogen) at refrigeration temperature (33°-37° C.). Storing irradiated yellow perch (treated at 0.1, 0.2, and 0.3 Mrad) under controlled atmosphere resulted in fish spoilage organisms' growing much more slowly than they do on similarly irradiated perch held under normal atmosphere.</p> </div> <div data-bbox="608 506 638 592"> <p>(over)</p> </div> <div data-bbox="652 140 697 1067"> <p>COMMERCIAL FISHERIES ABSTRACTS VOL 22 NO 4 PAGE 9 UNITED STATES DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE ABSTRACTER: F. T. Piskur</p> </div>
<div data-bbox="727 1358 801 2102"> <p>3.12 (*) SUSCEPTIBILITY OF HEAT-TREATED SPORES OF BACILLUS FIRMUS AND BACILLUS PULVIFACIENS TO THREE DIFFERENT FOOD PRESERVATIVES</p> </div> <div data-bbox="816 1131 927 2102"> <p>Yokoseki, Motonobu (Takai Regional Fisheries Research Laboratory, Chu-o-ku, Kachidoki, Tokyo, Japan), Hidemichi Suemitsu (Ehime Prefectural Institute of Chemical Technology, Matsuyama, Japan), and Mitsuko Nakayama Bulletin of the Japanese Society of Scientific Fisheries 34, No. 10, 930-936 (October 1968)</p> </div> <div data-bbox="942 1142 1209 2102"> <p>The purpose of this study was to determine the effect of preheat treatment of certain bacterial spores on their susceptibility to the growth-inhibiting action of furylfuramide, sorbic acid, and tylosin. Spores of <i>Bacillus firmus</i> and <i>B. pulvifaciens</i> isolated from spoiled fish sausages were used. Their resistance to the test preservatives was confirmed. Spores from 3 days' cultures at 37° C. were collected and suspended in phosphate buffer at pH ranging from 5.5 to 7.0. The spore suspension was heated for 50 minutes at temperatures ranging from 75° to 95° C. None of the preheat treatments had any significant effect on lowering of the resistance of the spores of <i>B. firmus</i> and <i>B. pulvifaciens</i> to possible growth-inhibiting action of any of the three preservatives. This work demonstrates the limitations of using combined heat treatment and certain chemicals for the processing of foods. [8 figures, 8 references]</p> </div> <div data-bbox="1216 1864 1239 2048"> <p>*Item on back of card.</p> </div> <div data-bbox="1298 1261 1328 2123"> <p>COMMERCIAL FISHERIES ABSTRACTS VOL 22 NO 4 PAGE 9 UNITED STATES DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE ABSTRACTER: L. Baldwin</p> </div>	<div data-bbox="727 355 779 1045"> <p>3.15 RADIATION STERILIZATION OF PREFRIED COD AND HALIBUT PATTIES</p> </div> <div data-bbox="793 75 897 1045"> <p>Sinnhuber, R. O., Mary K. Landers, and T. C. Yu (Department of Food Science, and Technology, Oregon State University, Corvallis 97331); Morris Simon, and Fred Heiligman (U.S. Army Natick Laboratories, Natick, Massachusetts 01760) Food Technology 22, No. 12, 74-76 (December 1968)</p> </div> <div data-bbox="905 64 1053 1045"> <p>Recent progress with meat products indicates that irradiation treatment may be suitable for preservation of food products for human consumption. To be acceptable, such products must not only be wholesome and nutritious but must be of high quality and keep well at ambient temperatures. The purpose of this study was to develop prefried "heat-and-serve" products from cod and haddock that would withstand room temperature storage for 1 year after radiation-sterilization.</p> </div> <div data-bbox="1061 53 1261 1045"> <p>Breaded and prefried cod and haddock patties were irradiated at 4.5 Mrad at ambient temperature and stored for 12 months at 22° C. Periodic examinations were made during this storage period to assess the quality of the patties and to determine the effects of antioxidants added to the fish flesh. The antioxidants used were: Tenox-6 (mixture of butylated hydroxyanisole, butylated hydroxytoluene, propyl gallate, citric acid, propylene glycol, and vegetable oil); 2,4,5-trihydroxybutyphenol; and thioldipropionic acid. The products were evaluated by flavor panels and by color reflectance measurements.</p> </div> <div data-bbox="1239 528 1261 614"> <p>(over)</p> </div> <div data-bbox="1283 161 1328 1067"> <p>COMMERCIAL FISHERIES ABSTRACTS VOL 22 NO 4 PAGE 9 UNITED STATES DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE ABSTRACTER: F. T. Piskur</p> </div>

2.9 CIGUATOXIN: MORE THAN AN ANTICHOLINESTERASE

Rayner, Martin D. (Department of Physiology, University of Hawaii, Honolulu 96822), Thomas I. Kosaki, and Enid L. Fellmeth (Hawaii Institute of Marine Biology)
Science **160**, No. 3823, 70-71 (April 5, 1968)

Although Li (1965) and Scheuer et al. (1967) have described the anticholinesterase activity of ciguatoxin, the present authors question that the entire action of this toxin can be explained so simply. Therefore they studied the effects of ciguatoxin on the respiratory system of rats--the usual cause of death from ciguatera poisoning is respiratory failure.

The effect of varying amounts of ciguatoxin, physostigmine, paraoxon, acetylcholine, and atropine injected into the rats was followed. The absence of any but the most superficial similarity between the effects of ciguatoxin and the anticholinesterases physostigmine and paraoxon suggests that the respiratory effects of ciguatoxin are not primarily caused by anticholinesterase action. The apparent similarity of the initial respiratory effects of ciguatoxin and acetylcholine suggests a transmitterlike cholinomimetic action. The lack of antagonism by atropine, which is an effective antagonist of the respiratory actions of acetylcholine and of the peripheral actions of ciguatoxin, indicates that the action of ciguatoxin may be more complex than has been previously reported. Since atropine did not block the major respiratory effects of ciguatoxin, the authors doubt that the toxin is purely an anticholinesterase in its action.

[Abstracter: L. Baldwin]

2.12 (Cross References: 2.116, 9.1)

Individual fishes for periods of time, a statistical treatment within a defined volume is developed. Finally, from the given target strength of the fish, the volume appropriate to the size of the fish is specified.

The authors indicate that the technique of acoustic enumeration is of prime use to fisheries biologists and has two main applications: (1) to estimate stock and stock density independent of catch per unit effort and (2) to estimate stock by age-groups before exploratory fishing starts.

An appendix describes the calculation of the true volume sampled by the echosounder. [7 figures, 10 references]

3.15

There were no significant differences in flavor between the nonirradiated control samples held at -18° C. and the irradiated samples (with or without antioxidants) that had been stored for 6 months at 22° C. After 12 months of storage, the nonirradiated control patties were preferred to the irradiated patties; nevertheless, the latter, with one exception, scored on the "like" side of the hedonic scale. In general, nonenzymatic browning developed and increased slowly during storage. Antioxidants did not materially improve retention of original flavor scores or slow the browning of cod patties but did have a favorable effect on the halibut patties. [3 tables, 8 references]

3.15

Part B, Shelf Life Studies of Fresh-water Fish - Lake Trout and Whitefish, deals with (1) the effect of different levels of irradiation treatment on the flavor and pigments of lake trout and whitefish and (2) determination of the shelf life of these fish treated with pasteurizing doses of irradiation. These species can be irradiated to 0.5 Mrad before "off flavors" are detected. Lake trout filets irradiated to 0.2 and 0.3 Mrad had a shelf life at 33° F. of 19 and 26 days, respectively; whitefish filets, treated similarly, had a shelf life of 15 and 26 days, respectively. Shelf life for untreated filets was: lake trout, 8 days; whitefish, 12 days.

Part C, Chemical Evaluation of Quality Changes in Irradiated Perch Filets, concerns evaluation of degradation products of the stored fish. The content of volatile reducing substances correlated with the spoilage patterns defined by microbial plate counts and organoleptic evaluations. [12 figures, 24 tables, 4 references]

3.4	POLYCYCLIC HYDROCARBON COMPOSITION OF WOOD SMOKE Rhee, Ki Soon, and L. J. Bratzler (Department of Food Science, Michigan State University, East Lansing 48823) Journal of Food Science 33, No. 6, 626-632 (November-December 1968) Of all the carcinogens, polycyclic hydrocarbons may be the most abundant in the human environment. Some information is available on the content of polycyclic hydrocarbons in foods, but no extensive work has been done on the wood smoke itself. The purpose of the present study was to determine the polycyclic hydrocarbon content of whole wood smoke and the vapor phase of wood smoke. Hard maple sawdust was used, and the smoke was generated and collected from a smoke-generating unit. The hotplate temperature of the generating unit was 440° to 460° C., with the actual smoldering temperature being from 750°-800° C. The vapor phase from the whole wood smoke was obtained by separating the particle phase by use of an electrostatic air filter. The polycyclic hydrocarbons were isolated and separated by a combination of liquid-liquid extraction, chromatography on silicic acid, thin-layer chromatography with acetylated cellulose powder, and chromatography on aluminum oxide. The compounds were characterized by ultraviolet and fluorescent studies on the fractions obtained from the aluminum oxide column. (over)	6.19	NUTRITIVE CONTENT OF MENHADEN (BREVORTIA TYRANNUS) FISH MEAL EVALUATED BY CHEMICAL METHODS: MANUFACTURED BY HEAT-TRANSFER METHOD Kifer, R. R., R. J. DeSessa, and M. E. Ambrose (Bureau of Commercial Fisheries Technological Laboratory, College Park, Maryland; Haynie Products, Inc., Baltimore, Maryland) Feedstuffs 41, No. 3, 44-45 (January 18, 1969) Before 1966, the basic method of manufacturing fish meal and fish oil from menhaden was the wet-reduction process. In general, the process consists of cooking the fish with live or indirect steam, pressing the liquid and solubilized protein from the cooked fish pulp, drying the presscake in rotary driers (to a moisture level of about 8 percent, a protein level of about 61 percent, and a fat level of about 9 percent), screening and centrifuging the liquid to separate the oil from the stickwater, and condensing the stickwater in evaporators to yield fish solubles (which is about 50 percent solids at the end). Although this process produces a good-quality meal, provided proper care is taken, much of the vitamins, soluble protein, and growth and stress factors are separated from the meal and run off into the fish solubles. When they are dried back on the meal to make whole meal, some of their value is lost in the reheating process. Moreover, the entire process is open, and only the most costly and elaborate deodorizing units can effectively eliminate the odors generated at every step of the processing. (over)
4.11	SYMPOSIUM: SPECTROSCOPY AND X-RAY DIFFRACTION Conducted by the American Oil Chemists' Society at the AOCS-AACC Joint Meeting, Washington, D.C., March 31-April 4, 1968) O'Connor, R. T. (Chairman) Journal of the American Oil Chemists' Society 45, No. 11, 764-822 (November 1968) Six of the most up-to-date techniques and methods of analysis used in fatty acid or lipid chemistry were reviewed at the Symposium. In addition, two papers on gas-liquid chromatography and one paper on the development of computer-aided chemical spectroscopy were presented. These are as follows: Introduction: The Great Variety of Spectrographic Techniques Available for the Analysis of Fatty Acids and Lipids, by Robert T. O'Connor, pp. 764-766. Neutron Activation Analysis and its Application to the Analysis of Food Products, by Vincent P. Guinn, pp. 767-774. Application of Wide-Line NMR to Analysis of Cereal Products and Fats and Oils, by W. D. Pohle and R. L. Gregory, pp. 775-777. High Resolution NMR Spectroscopy and Some Examples of its Use, by C. Y. Hopkins, pp. 778-783. (over)	COMMERCIAL FISHERIES ABSTRACTS VOL 22 NO 4 PAGE 11 UNITED STATES DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE ABSTRACTER: F. T. Piskur	COMMERCIAL FISHERIES ABSTRACTS VOL 22 NO 4 PAGE 11 UNITED STATES DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE ABSTRACTER: F. T. Piskur

6.190 (Cross Reference: 7.9)

Gas-Liquid Chromatography of Lipids, Carbohydrates, and Amino Acids, by S. F. Herb, pp. 784-788.

Atomic Absorption Spectroscopy, by Biagio Piccolo and Robert T. O'Connor, pp. 789-792.

The Role of X-Ray Diffraction in Studies of the Crystallography of Monoacid Saturated Triglycerides, by C. W. Hoerr and F. R. Paulicka, pp. 793-797.

Applications of Infrared Absorption Spectroscopy in the Analysis of Lipids, by Norman K. Freeman, pp. 798-809.

Mass Spectrometry of Lipid Molecules, by Kwok K. Sun and Ralph T. Holman, pp. 810-817.

Computer Aided Spectroscopy, by Robert O. Crisler, pp. 818-822.

3.4

Eleven polycyclic hydrocarbons were separated and identified: naphthalene, acenaphthene, fluorene, phenanthrene, anthracene, pyrene, fluoranthene, 1,2-benzanthracene, chrysene, 3,4-benzopyrene, and 1,2-benzopyrene. Whole wood smoke contained more of each hydrocarbon than did the vapor phase. The authors postulate that the use of an electrostatic precipitator in food smoking may reduce the amount of polycyclic hydrocarbons, but whether foods treated with such smoke would have the same acceptability and keeping quality as those treated with whole wood smoke remains to be determined. [2 tables, 6 figures, 36 references]

Four fish meals were used: (1) Peruvian fish meal, (2) the same type of Peruvian fish meal as in (1) but treated immediately after being manufactured with 400 p.p.m. ethoxyquin, (3) an Icelandic herring meal, and (4) an anchovy meal (of unknown origin). The meals were added in varying amounts to a basal ration fed to male cross-bred day-old chicks. The procedures for experimental group composition, ME determination, and carcass analysis were similar to those described by Carew and Hill (1964).

The crude fat content of the untreated Peruvian, treated Peruvian, herring, and anchovy meal was 7.92, 13.06, 9.56, and 5.84, respectively. Determined ME values reflected the crude fat content. The untreated Peruvian meal had 17.7 percent higher ME value and 5 percent more crude fat than the untreated Peruvian meal had. Presumably the unextractable fat residue (resulting from oxidation) is of little nutritional value and antioxidant treatment helps preserve the ME value of the meals.

Distinct differences were demonstrated in the utilization of the ME for tissue energy between the basal diet, antioxidant-treated fish meal, and the untreated meals: regression line calculations indicated net availability of 58.7, 54.9, and 43.7 percent, respectively. The growing chicks utilize ME of the basal diet and the stabilized fish meal about 14 and 10 percent more efficiently for maintenance plus growth than they do the untreated meals.

On the basis of the available experimental evidence, the author suggests that a system based on ME values fails to evaluate adequately the energy content of different feedingstuffs for growing chicks and is, therefore, not acceptable as a valid energy evaluation system for practical poultry-feed formulation. [2 figures, 9 tables, 23 references]

6.19 (Cross Reference: 6.13)

Since 1966, the domestic menhaden industry has also used a heat-transfer process for menhaden reduction. This process, in general, consists of cutting the raw whole fish into 1-in. chunks, making a slurry of the chunks and previously produced hot oil, dehydrating the slurry in evaporators at steam temperature under reduced pressure (leaving protein solids, bones, and oil in fine suspension), centrifuging the dehydrated slurry to yield a cake and to remove much of the oil, and pressing the cake to remove more oil. All these operations are totally enclosed. Finally, the cracklings are treated with ethoxyquin, cured, and ground. The final product is, in effect, defatted, dehydrated fish.

Menhaden meals prepared by the heat-transfer method (HTM) were chemically analyzed for proximate composition, total fat, amino acids, macro minerals, and micro minerals. The mean values obtained were compared with those for menhaden meals prepared by the wet-reduction method (WRM). All results are tabulated. The HTM meals had 4 percent more protein, 5.19 percent less moisture, 0.96 percent less ash, 0.85 percent more ether fat, and 0.66 more total fat than the WRM meals.

They had 0.79 percent less calcium, 0.37 percent less phosphorus, 5.63 p.p.m. less copper, 43.0 p.p.m. less zinc, 4.1 p.p.m. less chromium, 5 p.p.m. less boron, 14.8 p.p.m. less barium, and 17.4 p.p.m. less strontium than the WRM meals; however, they had 0.19 percent more sodium and 0.63 percent more potassium. The average fluoride level was 68 p.p.m., quite low relative to the over 200 p.p.m. in fish protein concentrate made from hake.

When the amino acids are expressed as a percent of protein, the difference between the meals is slight (with the exception of tryptophan, which was 0.13 percent less, and histidine, which was 0.65 percent more in the HTM meal). But when amino acids are expressed as a percent of fish meal, the content of all amino acids is higher in the HTM meals. [7 tables, 3 references]

6.190	KENTUCKY LAKE WHOLE FISH MEAL AS A PROTEIN SUPPLEMENT FOR GROWING-FINISHING SWINE	Wofford, George, S. A. Griffin, E. R. Lidvall, and M. R. Johnston Tennessee Farm and Home Science Progress Report No. 67, 14-15 (July, August, September 1968) (University of Tennessee, Knoxville 37916)	Most of the fish meal that has been used as a protein supplement in animal feeds has been made from salt-water fish. However, experiments have shown that meal made from fresh-water fish is of equivalent value. To examine the feasibility of using rough lake fish as a source of fish meal, the authors determined the effects of different levels of fresh-water whole-fish meal on the growth and carcass characteristics of pigs.	7.86 (*)	DETECTION AND INCIDENCE OF SPECIFIC SPECIES OF SPOILAGE BACTERIA ON FISH. I - METHODOLOGY	Levin, R. E. (Department of Food Science and Technology, University of Massachusetts, Amherst 01002) Applied Microbiology 16, No. 11, 1734-1737 (November 1968)	Direct enumeration of proteolytic organisms on fishery products is useful in projecting refrigerated storage life and in assessing the adequacy of processing methods. Proteolytic organisms that are exposed to gamma radiation and survive may show reduced proteolytic activity and may, therefore, be difficult to detect by conventional methods. The purpose of the study was (1) to investigate the use of Peptone Iron Agar as a differential plating medium for direct identification and enumeration of <u>Pseudomonas putrefaciens</u> from fishery products and (2) to develop a sensitive method for readily detecting and enumerating weakly and strongly proteolytic bacterial organisms from fish tissue.
6.54	QUALITY OF FISH PROTEIN CONCENTRATE PREPARED BY DIRECT EXTRACTION OF FISH WITH VARIOUS SOLVENTS	Moorjani, M. N., R. Balakrishnan Nair, and N. L. Lahiry (Central Food Technological Research Institute, Mysore-2, India) Food Technology 22, No. 12, 61-65 (December 1968)	The purpose of this study was to examine the efficiency of various solvents in the extraction of fish for the manufacture of fish protein concentrate (FPC). The solvents tested were ethanol, isopropanol, and acetone. The sardine <u>Sardinella longiceps</u> was used as the raw material because of its availability off the west coast of India.	7.86 (*)	DETECTION AND INCIDENCE OF SPECIFIC SPECIES OF SPOILAGE BACTERIA ON FISH. II - RELATIVE INCIDENCE OF PSEUDOMONAS PUTREFACIENS AND FLUORESCENT PSEUDOMONADS ON HADDOCK FILLETS	Chai, T., C. Chen, A. Rosen, and R. E. Levin (Department of Food Science and Technology, University of Massachusetts, Amherst 01002) Applied Microbiology 16, No. 11, 1738-1741 (November 1968)	Previous work has demonstrated that members of the genera <u>Pseudomonas</u> and <u>Achromobacter</u> constitute the major spoilage bacteria of fish. <u>P. putrefaciens</u> has been implicated as one of the predominant spoilage pseudomonads on North American white fish. The purpose of the present study was (1) to determine the numbers of <u>P. putrefaciens</u> on haddock fillets and (2) to establish the numerical relation between <u>P. putrefaciens</u> and other spoilage flora on haddock fillets held under chilled storage.

6.190	KENTUCKY LAKE WHOLE FISH MEAL AS A PROTEIN SUPPLEMENT FOR GROWING-FINISHING SWINE	Wofford, George, S. A. Griffin, E. R. Lidvall, and M. R. Johnston Tennessee Farm and Home Science Progress Report No. 67, 14-15 (July, August, September 1968) (University of Tennessee, Knoxville 37916)	Most of the fish meal that has been used as a protein supplement in animal feeds has been made from salt-water fish. However, experiments have shown that meal made from fresh-water fish is of equivalent value. To examine the feasibility of using rough lake fish as a source of fish meal, the authors determined the effects of different levels of fresh-water whole-fish meal on the growth and carcass characteristics of pigs.	7.86 (*)	DETECTION AND INCIDENCE OF SPECIFIC SPECIES OF SPOILAGE BACTERIA ON FISH. I - METHODOLOGY	Levin, R. E. (Department of Food Science and Technology, University of Massachusetts, Amherst 01002) Applied Microbiology 16, No. 11, 1734-1737 (November 1968)	Direct enumeration of proteolytic organisms on fishery products is useful in projecting refrigerated storage life and in assessing the adequacy of processing methods. Proteolytic organisms that are exposed to gamma radiation and survive may show reduced proteolytic activity and may, therefore, be difficult to detect by conventional methods. The purpose of the study was (1) to investigate the use of Peptone Iron Agar as a differential plating medium for direct identification and enumeration of <u>Pseudomonas putrefaciens</u> from fishery products and (2) to develop a sensitive method for readily detecting and enumerating weakly and strongly proteolytic bacterial organisms from fish tissue.
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6.54

from the latter process were not of uniform color and developed a fishy flavor during storage.

FPC prepared from whole fish had a dull appearance and had less protein and more minerals and collagen than did FPC prepared from eviscerated fish. Rat feeding tests demonstrated the absence of any toxic factors in the FPC prepared from whole sardine. [7 figures, 5 tables, 12 references]

7.86

Fluorescent pseudomonads constituted the second major group of spoilage pseudomonads, *P. putrefaciens* and fluorescent pseudomonads increased at a faster rate than did the other proteolytic organisms. [5 figures, 4 tables, 8 references]

The method described by the author uses a dulcitol-selenite enrichment medium in a motility flask. It is more rapid than the conventional methods--detection of *Salmonella* can be accomplished within 24 to 50 hours. The new technique is just as sensitive as conventional *Salmonella* detection techniques. Fewer numbers of samples for microscopic examination are required, which saves time and materials. [1 figure, 2 tables, 16 references] [Abstract: F. T. Piskur]

DETECTION OF *SALMONELLA* BY A SINGLE-CULTURE TECHNIQUE

Abrahamson, Kerstin, G. Patterson, and H. Riemann (Department of Epidemiology and Preventive Medicine, University of California, Davis 95616)
Applied Microbiology 16, No. 11, 1695-1698 (November 1968)

The methods used for detection of *Salmonella* in foods are complex and time-consuming. Lengthy analyses are not practical or acceptable for foods moving rapidly through distribution channels. The present studies were undertaken to develop a reliable and fast technique.

7.86 (Cross Reference: 2.05)

6.190

was increased, and the soybean meal and the meat meal were decreased proportionally in the fishmeal-supplemented diets.

After about 2½ months, when the pigs had attained market weight, they were taken off the test diets and slaughtered. Standard carcass measurements revealed no significant differences in the efficiency of the diets. Nor were the carcass characteristics significantly different. Backfat ranged from 1.27 in. (for the 50 percent diet) to 1.35 in. (for the 25 percent diet); length ranged from 29.2 in. (for the 25 percent diet) to 29.6 in. (for the 50 percent diet); and the percent of lean cuts ranged from 54.5 (for the control diet) to 55.5 (for the 75 percent diet). Measured at the tenth rib, loineyes varied from 4.48 sq.in. (for the 75 percent diet) to 4.72 sq.in. (for the 50 percent diet); penetrometer readings for the loineye muscle ranged from 210 (for the 75 percent diet) to 257 (for the 25 percent diet) and for the backfat, from 38 (for the 75 percent diet) to 51 (for the control diet).

Diet	Weight characteristics of pigs				Feed consumed	
	Average weight		Average daily gain		per 100-lb. gain	
	Initial	Final	Lb.	Lb.	Lb.	Lb.
Control	49	217	1.72	1.72	322	322
25% sup.	49	215	1.83	1.83	304	304
50% sup.	49	219	1.81	1.81	314	314
75% sup.	49	217	1.78	1.78	298	298

7.86

ENUMERATION AND DIFFERENTIAL PLATE COUNTING OF MICROBIAL COLONIES BY A STEROSCOPIC MICROSCOPE PATTERN COVER METHOD

Attebery, H. R., and S. M. Finegold (University of California at Los Angeles, Schools of Dentistry and Medicine, and Wadsworth Veterans Administration Hospital, Los Angeles, California 90073)
Applied Microbiology 16, No. 11, 1795-1798 (November 1968)

It is known that the temperature of the agar during pouring of plates may affect the recovery of certain marine bacteria. In this report, the authors describe limited studies on the recovery of bacteria using a new medium containing carrageenan as a gelling agent over an expanded pouring temperature range of from 30° to 65° C.

They found that the new medium was not as rigid as an agar medium. Surface moisture condensation was not a problem. There was extensive spreading of colonies of *Pseudomonas* sp. Pour plates using the new medium can be prepared at lower temperatures than can those using the agar medium. Increased recoveries of marine bacteria were achieved with the new medium. The authors were encouraged with the results and suggest that carrageenan and other seaweed polysaccharides should be studied further for possible use in microbiological media. [2 tables, 2 references] [Abstract: F. T. Piskur]

<p>8.8 SIGNIFICANCE OF DIMETHYL SULFIDE TO THE ODOR OF SOFT-SHELL CLAMS</p> <p>Brooke, Richard O., Joseph M. Mendelsohn, and Frederick J. King (Bureau of Commercial Fisheries Technological Laboratory, U.S. Fish and Wildlife Service, Gloucester, Massachusetts)</p> <p>Journal of the Fisheries Research Board of Canada <u>25</u>, No. 11, 2453-2460 (November 1968)</p> <p>Dimethylsulfide (DMS) has been isolated from different species of fish and shellfish products, including chilled cod, haddock, Pacific oysters, and soft-shell clams. High concentrations of DMS have been associated with off flavors in certain fishery products. Such off-odors are caused by postmortem breakdown of large amounts of dimethyl-beta-propiethetin (DMPT), which accumulate in the flesh of the fish as a result of heavy feeding by the fish on certain species of plankton. DMPT appears to be the most significant precursor of DMS in fresh soft-shell clam meats. To obtain a better understanding of the odor characteristics of chilled clam meats, the authors carried out this study to determine (1) the concentration of DMS in soft-shell clam meats and (2) whether the same concentration of chemically pure DMS resembles the typical odor of soft-shell clam meats.</p> <p>Twelve samples of fresh soft-shell clams were collected over their spawning period. The average concentration of DMS in the meats of these clams was 3 P.P.M.</p> <p>(over)</p> <p>COMMERCIAL FISHERIES ABSTRACTS VOL. 22 NO. 4 PAGE 15 UNITED STATES DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE</p> <p>ABSTRACTER: F. T. Piskur</p>	<p>9.1 MATURATION OF GONADS OF OYSTERS, <u>CRASSOSTREA VIRGINICA</u>, OF DIFFERENT GEOGRAPHICAL AREAS SUBJECTED TO RELATIVELY LOW TEMPERATURES</p> <p>Loosanoff, Victor L. (17 Los Cerros Drive, Greenbrae, California 94904)</p> <p>The Veliger <u>11</u>, No. 3, 153-163 (January 1, 1969) (California Malacozoological Society, Inc., R. Stohler, Editor, Department of Zoology, University of California, Berkeley 94720)</p> <p>Information on the physiological adaptations and requirements of closely related natural populations of a species of fish or shellfish contributes to our understanding of intraspecific relations. [Such understanding of the variations in physiological characters of races or subspecies is essential in the rational utilization of our commercial fisheries.]</p> <p>Groups of oysters from Long Island Sound, New Jersey, Virginia, South Carolina, and Florida were kept in Milford Harbor, Connecticut, for about 3 months and then subjected to a long conditioning period at temperatures of 12°, 15°, or 18° C. These groups of oysters showed sharp differences in the stage of development of their gonads. For example, some of the oysters from Long Island Sound were able to ripen even at 12° C.--after 68 days of conditioning about 65 percent of these oysters contained either active spermatozoa or mature eggs. The New Jersey and the southern groups of oysters, on the other hand, differed radically from the Long Island Sound oysters by being unable to carry on active gametogenesis at 12° C.</p> <p>(over)</p> <p>COMMERCIAL FISHERIES ABSTRACTS VOL. 22 NO. 4 PAGE 15 UNITED STATES DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE</p> <p>ABSTRACTER: F. T. Piskur</p>
<p>8.8 SANITATION GUIDELINES FOR THE BREADED-SHRIMP INDUSTRY</p> <p>Clem, Joe P., and E. Spencer Garrett (Bureau of Commercial Fisheries Technological Laboratory, Pascagoula, Mississippi 39567)</p> <p>Circular 308, 14 pp. (November 1968) (Bureau of Commercial Fisheries, U.S. Fish and Wildlife Service, Washington, D.C. 20240)</p> <p>Introduction.--The ever-increasing application of technology by the food-processing industry makes the sanitation measures used some years ago inadequate. As processing becomes more complex and sophisticated, so do the sanitation problems. Large numbers of workers standing along the processing lines handle the product. If any one of them is guilty of the slightest hygienic malpractice, he may contaminate the product and thereby affect the health of hundreds of consumers.</p> <p>The solution lies in the rigid control of plant sanitation. Sanitation-control measures are not merely cleaning procedures--they involve all the procedures that ensure that finished products reach the consumer in the best possible condition. The guidelines presented here were prepared to help the breaded-shrimp industry achieve this goal.</p> <p>(over)</p> <p>COMMERCIAL FISHERIES ABSTRACTS VOL. 22 NO. 4 PAGE 15 UNITED STATES DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE</p> <p>REPRINTED IN PART</p>	<p>9.11 FISHERMEN'S ATLAS OF MONTHLY SEA SURFACE TEMPERATURES FOR THE GULF OF MEXICO</p> <p>Rivas, Luis R. (Bureau of Commercial Fisheries Exploratory Fishing and Gear Research Base, Pascagoula, Mississippi 39567)</p> <p>Circular 300, 33 pp. (November 1968) (Bureau of Commercial Fisheries, U.S. Fish and Wildlife Service, Washington, D.C. 20240)</p> <p>Interest in the fisheries and the marine biology of the Gulf of Mexico has generated a strong demand for information about sea surface temperatures and how their variations affect marine organisms. Because no detailed monthly charts of sea surface isotherms covering the entire year in the Gulf have been published, this atlas was compiled. The data should be helpful to fishermen, particularly for predicting fish concentrations in the shallower coastal waters where the data covering surface temperatures are more adequate and meaningful.</p> <p>The atlas is based on information obtained from the National Oceanographic Data Center, which has on file observations made from merchant and navy ships during 1949-1961, and information from the author's agency, which has exploratory fishing data taken during 1951-1965. These working data, representing over 87,000 observations, were printed tabulations recorded by 1-degree quadrangles according to the Marsden Square method.</p> <p>(over)</p> <p>COMMERCIAL FISHERIES ABSTRACTS VOL. 22 NO. 4 PAGE 15 UNITED STATES DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE</p> <p>ABSTRACTER: L. Baldwin</p>

8.8 (Cross Reference: 3.236)

Contents.--

Physical plant
Buildings
Floors, walls, and ceilings
Water, plumbing, and other facilities
Waste-disposal system
Dry-storage area
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Operating procedures
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Health
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Habits
Supervision

9.11 (Cross Reference: 1.0117)

Surface temperatures vary with latitude and the season. In January and February, temperatures in the northeastern section of the Gulf (61° F.) are as much as 16 degrees colder than in the southeastern section (77° F.). This variation represents an average temperature drop of 1° F. every 21 or 22 miles. In the western part of the Gulf, the temperature gradient during January and February is similar but less sharp. During the summer, surface temperatures as a rule are a nearly uniform 83° F. throughout the Gulf.

In winter, temperatures in the central Gulf are about the same from the surface down to from 7 to 50 fathoms; in summer, the surface temperatures extend from just below the surface to about 15 fathoms down. Surface temperatures in the southern and the northern Gulf extend to depths of at least 25 fathoms in winter. In the summer, however, the difference between temperatures at the surface and at about 20 fathoms down is 10° F. in the southern part of the Gulf and 15° F. in the northern part. During the summer, upwelling occurs along the north coast of Yucatan.

The marked fluctuation between summer and winter temperatures in the northern Gulf causes seasonal fluctuations in the shallow-water fauna. Such warm-water fishes as Spanish mackerel (*Scomberomorus maculatus*), tarpon (*Megalops atlantica*), scaled sardine (*Harengula pensacolata*, and Atlantic cutlassfish (*Trichiurus leporus*) are quite abundant in the northern Gulf from April to September but are very scarce from October to March.

The atlas consists of two graphs, one depicting the average surface temperatures throughout the Gulf by month and one depicting the temperature differences in the eastern part of the Gulf by month; three maps showing localities and the number and density of the observations; 12 maps showing by month the mean surface isotherms; and 12 maps showing by month the maximum and minimum surface temperatures in seven arbitrarily defined sectors. [9 references]

9.1 (Cross Reference: 1.81)

8.8
Subjective comparison of odors from the fresh clams and from solutions of pure DMS (in the range of concentrations found in the clam meats) suggested that DMS did, in fact, dominate the odor of fresh soft-shell clam meats.
[2 figures, 2 tables, 22 references]

The author concluded that there are distinct populations of *Crassostrea virginica* that require different temperature regimes for completion of gametogenesis and spawning. These experiments clearly indicate the existence of several physiological variants within the general populations of *C. virginica*.
[28 figures, 24 references]

9.16

SHELL PUNCHER-STRINGER OPENS WAY
TO USING OYSTER RAFTS ON BIG SCALE

Anonymous

National Fisherman 49, No. 10, 40, 7C (January 1969)

For several decades, oyster farmers in Japan and Europe have been catching baby oysters on shells strung together and suspended from rafts. With this system, the young oysters have access to all the fresh plankton that floats their way, and they are less vulnerable to such bottom predators as oyster drills and starfish. However, punching holes in shells and stringing them by hand is expensive in a high-labor market, so the solution had to be an automatic puncher-stringer. A Seattle, Washington, research firm now has such a machine.

The shell-punching process begins with a screening operation, during which the oyster shells are graded for size. The approximately uniform shells are then moved by conveyor to the rear of the punching machine, where an operator places them on an "index" carrier. The index carrier then positions the shells above metal piercing rods. Once a shell is in position, air cylinders are automatically activated to drive a hollow punch down onto it, forcing it onto the piercing rod. A clamp activated by another air cylinder holds the piercing rod in place during the punching process. Finally metal rods that telescope over threading wire are inserted onto a belt conveyor and are carried past a feeding device, which feeds the punched shells to them.

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UNITED STATES DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE

ABSTRACTER: L. Baldwin

9.19

THE MENACE OF MERCURY

Jernelov, A. (Swedish Air and Water Pollution Research Laboratory, Stockholm, Sweden)

New Scientist 40, No. 627, 627 (December 12, 1968)

About 10 years ago a mysterious illness occurred among fishermen and their families living around Minamata Bay, Japan. The first symptoms of the illness were numbness of the extremities and the lips, tunnel vision, and ataxia (loss of muscular coordination). People more seriously affected suffered critical damage to their central nervous system; many of these people died. Fetuses in women who seemed to be unaffected themselves were damaged.

In 1960, the cause of this "Minamata disease" was shown to be methyl-mercury that had been passed on by eating the fish and shellfish caught in Minamata Bay. The source of the mercury was the effluent of an acetaldehyde factory. Most of the mercury in the effluent was in the form of metallic mercury and inorganic divalent mercury, but small amounts of methyl-mercury were also present. These mercury compounds, especially methyl-mercury, were being concentrated in the tissues of marine organisms and were accumulating in increasing concentrations the higher the organism's position in the food chain. The concentration of mercury, chiefly as methyl-mercury, in the organisms used as human food reached from 20 to 50 p.p.m. on a fresh weight basis.

(over)

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UNITED STATES DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE

ABSTRACTER: L. Baldwin

9.2

AN ACTION PROGRAM TO DEMONSTRATE THE FEASIBILITY
OF INTRODUCING NEW TECHNIQUES IN THE LAKE SUPERIOR
COMMERCIAL FISHING INDUSTRY

Anonymous

Report prepared by the Bureau of Commercial Fisheries, U.S. Fish and Wildlife Service, Washington, D.C., 97 pp. (November 1968) (Technical Assistance Project No. 1083, under contract with the Economic Development Administration, U.S. Department of Commerce)

The object of the study was to analyze the existing condition of the industry and evaluate the possibilities for improving it. The research phase was completed in 1965. The action plan, the subject of the present report, involved the design and operation of an experimental processing plant that used the latest procedures for processing high-quality products. The operation of the plant was coordinated with the supply of fish from vessels similarly employing the best techniques available. The products were introduced into the commercial market following an intensive, coordinated promotional program.

The conclusions drawn from the action program are that the presently underutilized species of fish in Lake Superior could support a limited trawl fishery and a modern commercial processing facility. A two-vessel trawl operation is commercially feasible on Lake Superior. One vessel, operating full-time in the central portion of the Lake, would catch chub for the pet food market; the other

(over)

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UNITED STATES DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE

ABSTRACTER: F. T. Piskur

9.19

PROMISING ANTI-POLLUTANT: CHELATING AGENT NTA
PROTECTS FISH FROM COPPER AND ZINC

Sprague, John B. (Fisheries Research Board of Canada, Biological Station, St. Andrews, New Brunswick)
Nature 220, No. 5174, 1345-1346 (December 28, 1968)

Copper and zinc from mining operations may endanger fish in otherwise clean rivers. Concentrations of these metals one-tenth to one-twentieth of accepted standards for drinking water can be lethal for fish in rivers whose waters are very soft. In such rivers, continual prevention of pollution can be difficult.

Three chelating agents were tested for their ability to protect salmonid fish against copper-zinc toxicity: sodium citrate, which is moderately effective as an antipollutant; the disodium salt of ethylenediaminetetraacetic acid (EDTA), which must be used in a 6:1 ratio with the metal; and nitrilotriacetic acid (NTA), which seems to be the most promising of the three. One molecule of NTA chelates one ion of metal; moreover, it costs less than EDTA. NTA chelates a number of cations, including desirable constituents of natural waters, but it is selective for metal ions, selectively chelating all copper first, then zinc afterwards. Use of NTA as a temporary treatment for metal pollution (it is biodegradable within a few days in natural water) or as a means of carrying slugs of pollution past a critical area seems to be practicable. A patent for such use has been applied for. [1 table, 11 references]

[Abstracter: L. Baldwin]

9.16 (Cross Reference: 1.81)

The machine is totally air driven, with the air valve control (the air valves control the cylinders for clamping and punching) being operated by an enclosed cam that does not attract the abrasive dust created by the piercing operation. A specially designed air circuit provides for operation of two small cylinders from a single control valve (with delay sequence in both directions), makes speed adjustments easy, and smooths out the timing sequence.

The patent held on the machine by the firm is the first American patent for a shell puncher and stringer. A Frenchman holds an earlier one.

9.2 (Cross References: 1.0118, 3.2385)

vessel, operating part-time in the western part of the Lake, would catch smelt. Processing and distribution of breaded and unbreaded frozen products from chub, cisco, and smelt on a commercial scale appears economically feasible.

Four appendices to the report deal with the (1) conversion of gill net vessels to trawling, (2) theoretical operating costs of a new conventional-Gulf-type trawl vessel, and (3) logs of exploratory fishing operations in Lake Superior. [22 figures, 20 tables, 4 appendices, 3 references]

9.19

Scientists now regard mercury levels of 0.2 p.p.m. as the natural background level in fresh-water fish. In Sweden, fish from certain waters where fish have been found to contain more than 1 p.p.m. mercury may not be sold or given away. (This limit is provisional, pending further toxicological study.) In addition, Swedish authorities have recommended that fish containing between 0.2 and 1.0 p.p.m. mercury not be eaten more than once a week.

In 1965, further incidents of methyl-mercury poisonings occurred at Agano River in Niigata. The source of mercury here was also a factory making acetaldehyde. Here, too, methylation of some of the mercury used as a catalyst occurred in the factory. To avoid further outbreaks of the illness, Japanese authorities have started a careful investigation of 194 industries that handle mercury.

In addition to the mercury in factory effluents, the amounts of mercury in foods have been increased by the intensive use of organo-mercury compounds in agriculture. In Japan, the agricultural use of organo-mercury compounds has been banned since 1967. In Sweden, the use of methyl-mercury as a seed dressing has been prohibited since 1966.

The chief sources of the mercury that contaminates fish are chlorine factories (the effluents of which contain inorganic mercury) and paper and pulp mills (the effluents of which contain phenyl-mercury). These mercury compounds are converted to methyl-mercury by microorganisms in the bottom sediments of lakes, rivers, and oceans, and the methyl-mercury is accumulated in fish and other aquatic organisms. Thence it passes to the human consumer. It can pass the placental barrier in mammals and penetrate cell membranes, thus inducing, by suppression of the mitotic spindle, such chromosomal abnormalities as aneuploidy.

POLYMER DIGESTS: A DESK-TOP LEARNING TOOL

Anonymous
Chemical and Engineering News 47, No. 7, 36-37 (February 17, 1969)

If all goes well, an easy-to-read monthly digest will be available shortly of the latest research in the physical chemistry of polymers. The digest will be offered by a firm in Minnetonka, Minnesota, for the purpose of supplying the need of scientists for easier access to current results of research.

Consulting scientists who are specialists in polymer chemistry will review up to 100 journals regularly. Important articles will be digested and printed in outline form on one or more cards. Subscribers will receive up to 80 such digests a month as well as a monthly index.

The advantage of the system lies in its specificity, its speed (articles will be digested within 2 to 4 weeks after publication), and the fact that the digest will not require any mechanical devices for information retrieval. The cards will be notched so that the system can be searched quickly by hand according to (1) the area of interest, (2) measurements involved (instrumentation), (3) polymer type, and (4) author.

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ABSTRACTER: F. Bruce Sanford

ABTRACTER: F. Bruce Sanford

9.7 JOURNALS AND THE LITERATURE EXPLOSION

Maddox, John

Nature 221, No. 5176, 128-130 (January 11, 1969)

The author deals with several problems that the editors of scientific journals must face. Among these are (1) the changing function of the scientific literature, (2) the stringent selection of articles, (3) the length of time articles are in the hands of referees, (4) and the problem of poor communication.

Changing function of the literature.--Historically, the function of published scientific articles has been to convey news of discoveries to those who otherwise would not receive it. Since World War II, however, many published articles have served more as records of events than as means of original communication. Scientists in a given field, using office duplicators, have tended to keep one another informed of new developments by mail.

Stringent selection of articles.--The number of unsolicited manuscripts submitted for publication in *Nature* increased from 5,471 in 1967 to 6,465 in 1968. A record number of manuscripts (3,114) was published in 1967, chiefly because of the need to work off a backlog. During 1968, the number of manuscripts published fell to 2,376, representing a still smaller proportion of the intake. This trend towards more stringent selection will probably continue.

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ABSTRACTER: F. Bruce Sanford

POLYMER DIGESTS: A DESK-TOP LEARNING TOOL

LITERATURE EXPLOSION

9.7

Time required to referee.--About two-thirds of the manuscripts sent to Nature find their way to referees. Many of them make the journey twice or even three times. Most referees return the manuscripts quickly, the median time being just over 2 weeks.

Problem of poor communication.--Is a balance to be struck between the interests of readers and contributors? And how will the balance change in the years ahead? Questions like these are a part of the basic question of what the scientific literature is for. They are asked with special frequency and insistence by scientists who want to see that an article is published with great speed. Such questions, however, are meaningless. The literature is meant for reading. If the interests of readers and authors conflict, the interests of the readers must determine policy.

The form of an article is more important than most scientists admit. People who earn a living by writing know that readers who consent to read any article from start to finish are indulgent. Professional authors therefore are surprised at the assumption by part-time authors that the written word is instantly devoured by all who see it.

The problem of poor communication by some scientific authors is not simply a problem of lack of language but of the lack of conviction by these authors that they must take the trouble to help their readers understand.

An important part of the function of a journal like Nature is to help authors--sometimes by coercion--to find easy ways of saying what they wish to say.

9.6 (Cross Reference: 0.3)

digest is compact enough to set on a man's desk. (The president of the company says that if a researcher must leave his desk to use an information tool, the researcher often does not do it.)

The president wants to expand his service into other areas, such as theoretical chemistry, and go beyond the digest concept. He says that, basically, he is looking at the present body of knowledge as if it were a natural resource--but one that is being tapped only partially. He says further that most research results are not used and are written up by research scientists who are not interested in their application. By processing research results, his company, he believes, can help professionally competent people grow faster.

9.4

and presenting survey data, design and construction of an experimental deep-sinking tuna purse-seine net, partial clarification of the genetically distinct racial structure of the northern anchovy, and completion of feeding studies on the California sardine population during the rise and fall of the fishery.

[89-4961 961 for a list of publications and a list of photographs, and a list of maps, 6 charts, 92 photographs, and a list of publications for the fishery.]

2725 Montlake Boulevard, Seattle, Washington 98102. [abstract: F. I. Plakur]

9.6 INDEX OF FISHERY TECHNOLOGICAL PUBLICATIONS 1918-55

Stansby, M. E., and Rosemary Schaiter (Compilers) (Technological Laboratory, Bureau of Commercial Fisheries, Seattle, Washington).

Circular 96, 237 pp. (1961) (Bureau of Commercial Fisheries, U.S. Fish and Wildlife Service, Washington, D.C. 20240)

This index covers reports written by the staff of the Bureau of Commercial Fisheries in the field of fishery technology between 1918 and 1955. It includes reports issued in Government publications as well as in trade and scientific journals. The index is divided into three main sections: (1) publication series (Each article is arranged in chronological order according to publication outlet.), (2) author index (Authors are listed alphabetically, each being followed by the series code(s) of his publication(s)), and (3) subject index (Each article is listed chronologically under 160-odd arbitrarily chosen subjects, which are arranged alphabetically.). A limited supply of the circular is available for distribution. A single copy may be obtained free of charge by writing to the Director, Food Science Pioneer Research Laboratory, Bureau of Commercial Fisheries, 2725 Montlake Boulevard, Seattle, Washington 98102. [abstract: F. I. Plakur]

9.6 (Cross Reference: 1.10)

to depletion and physical waste of the resource. Yet attempts to control depletion tend to intensify the economic waste, for such measures as restrictions on the size of the vessel, the kind of gear, or the times for fishing reduce efficiency rather than the amount of capital and labor invested.

Of the inanimate resources of the sea, oil and natural gas are the most valuable. Some wells are as far as 70 miles from shore. But even farther out, well beyond the edges of the Continental Shelf, are concretions of manganese, copper, cobalt, and nickel known as manganese nodules. These nodules cover vast areas of the sea bottom beneath waters that are outside the jurisdiction of any nation. Because nodule-bearing areas differ as widely in value as do mineral-bearing areas on land, specific areas will likely attract competitive attention from all the nations that have the capital and technological skill to take advantage of the resource.

The third resource involves usage--for ocean traffic, for recreational purposes, and for various types of development that affect international ocean resources by effecting changes in the marine environment (through pollution, channel dredging, dam building, and land filling, for example).

Three suggestions have been made to help distribute the use of these resources rationally: (1) extend the boundaries of each coastal state to midpoints in the ocean, (2) permit exploitation under the protection of the nation whose flag is flown by the entrepreneur, and (3) vest title to the resources in an international authority. [32 references]

0.38 (Cross Reference: 7.591)

(*) OXALOACETATE DECARBOXYLASE FROM COD.
A SHORTER PREPARATION AND CRYSTALLIZATION

Kosicki, G. W.
Biochemistry 7, No. 12, 4299-4302 (December 1968)

The report describes a short method of purifying oxaloacetate decarboxylase. The crystalline enzyme can be prepared from cod (*Gadus morhua* [morhua]) by the following steps: extract the frozen muscle, adjust the pH of the extract to 5.1, heat the suspension to 45° C., fractionate the enzyme with $(\text{NH}_4)_2\text{SO}_4$, further purify the enzyme by chromatography over $\text{Ca}_3(\text{PO}_4)_2$ -cellulose column, concentrate, and finally crystallize. The yield is about 80-85 mg. from 500 g. of frozen fish muscle. [2 figures, 3 tables, 3 references] [Abstracter: F. T. Piskur]

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0.38 (Cross Reference: 7.591)

(*) OXALOACETATE DECARBOXYLASE FROM COD.
MECHANISM OF ACTION AND STEREOSSELECTIVE REDUCTION
OF PYRUVATE BY BOROHYDRIDE

Kosicki, G. W., and F. H. Westheimer
Biochemistry 7, No. 12, 4303-4309 (December 1968)

The purpose of the study was to determine the mechanism of action of the oxaloacetate decarboxylase from cod. Earlier studies by other researchers have shown that the enzyme depends upon metal ions, preferably Mn^{2+} , for activity. The decarboxylation was conducted in the presence of sodium borohydride in an attempt to trap a Schiff base. (The decarboxylase from *Clostridium acetobutylicum* catalyzes the decarboxylation of acetoacetic acid by way of a Schiff base salt between the enzyme and substrate as an intermediate.)

The authors found that sodium borohydride had no effect on the activity of oxaloacetate decarboxylase from cod, regardless of whether a substrate was present or absent or whether pyruvate (the reaction product) was present or absent. The reduction of pyruvate by the borohydride in the presence of manganese ions and enzymes led to the formation of an excess of D-lactate. The research showed that the oxaloacetate decarboxylase from cod requires a metal ion for activity, but since the enzyme is not inactivated by borohydride and substrate, it presumably does not operate by way of a Schiff base mechanism.

[1 figure, 7 tables, 25 references] [Abstracter: F. T. Piskur]

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CHEMISTRY AND BIOCHEMISTRY

CHEMISTRY AND BIOCHEMISTRY

0.6 (Cross Reference: 3.230)

(*) CALCULATION AND MEASUREMENT OF HEAT TRANSFER IN FOODS

Dickerson, Roger W., Jr., and Ralston B. Read, Jr. (Milk Sanitation Research, HEW National Center for Urban and Industrial Health, 222 East Central Parkway, Cincinnati, Ohio 45202)

Food Technology 22, No. 12, 37-39, 49, 51-52 (December 1968)

The science of mathematics and heat penetration have been used by the canning industry to determine the efficacy of canning processes. The "heat penetration test" yields data that can be used to establish the necessary process for canned foods. After a product is canned properly, the thermal history is no longer microbiologically significant. However, fresh and frozen foods must be under surveillance until consumed. The processor must be aware of product temperatures during all periods of heating, holding, and cooling.

A "heat penetration test" for foods subjected to several thermal processes will not yield sufficient information to permit calculation of the complete thermal history. Furthermore, the problem is compounded when different foods of different geometries are subjected to different heat transfer conditions imposed at different times. The authors describe the mathematical approach to identifying the thermal histories of such foods.

[6 figures, 3 tables, 18 references] [Abstracter: F. T. Piskur]

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2.12 (Cross References: 0.113, 9.11)

(*) CONTRIBUTION OF TEMPERATURE COEFFICIENTS
ON ACCURACY OF OCEANOGRAPHIC INSTRUMENTATION

Chase, Lawrence, James E. Boyd, and Richard L. Ribe (Testing Division--Instrumentation Department, U.S. Naval Oceanographic Office, Washington, D.C.)
Marine Technology Journal 3, No. 1, 29-32 (January 1969)

The work aimed at implanting man in the sea, defining the electrical conductivity-salinity-pressure relation with greater specificity, and growing food in the oceans all call for precise temperature measurements. Yet the combined effects of the temperature coefficient and thermal time response contribute to erroneous electronic measurements.

These effects are discussed with particular emphasis on deep-sea temperature probes. The authors point out that electronic instruments are generally protected by thick-walled housings, so their actual interior temperature is unknown during rapid lowering and raising. As a result, the use of laboratory-calibrated curves can make for significant error. This paper describes a method for modifying the laboratory-determined calibration by using temperature coefficients to derive a curve that will yield more representative readings during dynamic field operations. The authors describe the derivation of the coefficients and illustrate the application of the modified curve. [5 figures, 8 references]

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[Abstracter: L. Baldwin]

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FOOD TECHNOLOGY

OCEANOGRAPHY

0.4 (Cross Reference: 4.9)

A DIETARY PROGRAM TO LOWER SERUM CHOLESTEROL

Remmel, Patricia S., Mary P. Casey, Robert B. McGandy, and Fredrick J. Stare (Department of Nutrition, Harvard University School of Public Health, Boston, Massachusetts)

Journal of the American Dietetic Association 54, No. 1, 13-19 (January 1969)

The National Diet-Heart Study (NDHS) Research Group reported in 1968 on mass field trials on the prevention of coronary heart disease among apparently healthy individuals. In that study, nutrient consumption was changed by altering the composition of the foods. This present study is a 2-year followup program in which dietary advice was given to decrease moderately the consumption of saturated fat and cholesterol and moderately increase polyunsaturated fat intake. Observations were made on the serum cholesterol-lowering response of the individuals who formerly participated in the NDHS.

This study demonstrated that dietary change is acceptable to healthy middle-aged men who receive proper nutritional information. The dietary change was made by altering the consumption patterns of foods readily available on the market. This modification in the diet, involving levels of saturated and unsaturated fat and cholesterol, was beneficial in lowering serum cholesterol in middle-aged men. [7 tables, 12 references]

[Abstract: F. T. Piskur]

0.38

OXALOACETATE DECARBOXYLASE FROM COD. CATALYSIS OF HYDROGEN-DEUTERIUM EXCHANGE IN PYRUVATE

Kosicki, G. W.

Biochemistry 7, No. 12, 4310-4314 (December 1968)

In previous work, the author showed that the mechanism for the decarboxylation of oxaloacetate by oxaloacetate decarboxylase is by way of a metal ion-oxaloacetate-enzyme complex through the enol form of pyruvate to the keto form of pyruvate.

In this study, he demonstrates the reverse reaction: the enzyme in the presence of metal ion catalyzes the exchange of hydrogen atoms of pyruvate with solvent, leading to the enol form of pyruvate from the keto form. This catalyzed hydrogen exchange was found to be metal-ion dependent and to be inhibited by oxalate, as is the catalyzed decarboxylation of oxaloacetate and the catalyzed sodium borohydride reduction of pyruvate. [2 figures, 4 tables, 11 references]

[Abstract: F. T. Piskur]

NUTRITION AND MEDICINE

CHEMISTRY AND BIOCHEMISTRY

2.12 (Cross References: 0.112, 9.11)

UNDERWATER SLOW-SCAN TELEVISION

Parrish, W. F., and P. D. Lee (Westinghouse Underseas Division, Ocean Research and Engineering Center, Annapolis, Maryland)

Marine Technology Journal 3, No. 1, 89-94 (January 1969)

Although television systems operated at conventional speeds (30 frames per second) can be used with special line amplifiers for any cable lengths, in-line amplifiers create cable-handling problems. Moreover, multiplexing a number of TV signals with other large bandwidth signals is often desirable. The logical solution is to reduce the television bandwidth by scanning the vidicon camera tube at a slower rate.

In a typical slow-scan TV camera system, the scene is exposed to the camera by flash lamp, scan is begun, and information is stored on the photosensitive surface of the camera tube. The information that is read off and sent to the surface by telemetry is recovered and displayed by a long persistence video monitor or a scan converter. The system's operational parameters dictate the rate at which the process is repeated. The problem is to ensure that the proper amount of image-bearing light reaches the faceplate of the camera tube and that the light is even across the image.

This paper describes some of the design problems peculiar to an underwater closed-circuit TV system, the procedures used in designing such a system, and the results of tests made on it both in air and in the water.

[Abstract: L. Baldwin]

[15 figures, 5 references]

1.017

ESTUARINE AND COASTAL FISHERIES

Anonymous

Australian Fisheries Newsletter 27, No. 11, 21-33 (November 1968)

The fisheries of Australia's shallow bays, estuaries, and coastal waters produce more than 28,000,000 lb. of fish. These fish, together with the 10,000,000 lb. produced by the trawl fishery, form the basis of the wet fish supply to the Australian fresh fish trade.

The varieties of fish caught vary with the State in which they are caught. This report contains short articles on the Victorian estuarine and inlet fishery; the Queensland beach, estuarine, and inlet fishery; the Queensland reef fishery; and the River Murray reach fishery, each followed by a catalog of the fishery. These catalogs are divided into five main sections: resources, fishing unit, operations, catch, and disposal of catch. Other short articles cover South Australian whiting, the bait fishery, giant perch (barramundi), mud and sand crab, whaling, and turtle hunting. An annotated bibliography of some 25 references concludes the report.

[Abstract: L. Baldwin]

APPARATUS AND EQUIPMENT

AUSTRALIAN FISHERIES

U.S. Patent 3,395,549
Food Technology 22, No. 12, 116 (December 1968)

The process involves freezing of shrimp in a liquid coolant. The shrimp are immersed in the coolant, which is confined in the lower peripheral portion of a revolving drum that is inclined at an angle to effect gravity flow of the shrimp. The coolant is forcibly jetted against the surface of the coolant bath to resubmerge the surfacing shrimp and to produce vigorous flow of coolant past the shrimp. The draining coolant is rechilled to predetermined temperature and recirculated.

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4.11 LIPID SEPARATION ON SEPHADEX LH-20

Downey, W. K., M. K. Keogh, and R. F. Murphy (National Dairy Research Center, The Agricultural Institute, Fermoy, County Cork, Irish Republic)
Biochemical Journal 110, No. 2, 13P-14P (November 1968)

During this preliminary investigation, the authors found that combined molecular-sieving and adsorptive properties of Sephadex LH-20 make it a versatile material for chromatography of polar and of nonpolar lipids.

[3 references]

[Abstracter: F. T. Piskur]

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PROCESSING FROZEN FISH

ORGANIC ANALYSIS

4.14 (Cross Reference: 1.951)

PRINCIPAL FATTY ACIDS OF DEPOT FAT AND MILK LIPIDS
FROM HARP SEAL (PAGOPHILUS GROENLANDICA) AND
HOODED SEAL (CYSTOPHORA CRISTATA)

Jangaard, P. M., and P. J. Ke (Fisheries Research Board of Canada Halifax Laboratory, Halifax, Nova Scotia)
Journal of the Fisheries Research Board of Canada 25, No. 11, 2419-2426 (November 1968)

The harp seal (Pagophilus groenlandica) and the hooded seal (Cystophora cristata) are of considerable economic importance to the eastern coastal area of Canada. The only data available on the lipids of the commercial oils prepared from these seals are based on the analysis of a sample from Newfoundland, which was most likely a mixture of blubber from the two species. The purpose of this study was to make available accurate data of the fatty acid composition of blubber and milk lipids from harp and from hooded seals.

The fatty acid composition is given for: (1) six samples of depot fat taken from harp seals and a sample of milk lipids, (2) three samples of depot fat from hooded seals and a sample of milk lipids, and (3) samples of commercial seal oils from each of 4 years' production. [2 tables, 18 references]

[Abstracter: F. T. Piskur]

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6.32

ALGAE: AMOUNTS OF DNA AND ORGANIC CARBON IN SINGLE CELLS

Holm-Hansen, Osmund (University of California, Institute of Marine Resources, P.O. Box 109, La Jolla 92037)
Science 163, No. 3862, 87-88 (January 3, 1969)

In 1964, Commoner postulated that the DNA content (deoxyribonucleic acid content) of a cell should be proportional to cell size. To test this hypothesis, the author examined various-sized cells that are closely related phylogenetically and that are similar physiologically and nutritionally--10 eukaryotic, unicellular algae that were growing photoautotrophically. He found that the smallest cells, those of Monochrysis lutheri and Navicula pelliculosa, contained about 10 picograms of organic carbon and 0.1 picogram of DNA per cell. The largest, Gonyaulax polyedra, contained 6,000 picograms of carbon and 200 picograms of DNA per cell. On the basis of total organic carbon content, the DNA content per cell was almost directly proportional to cell size. [1 figure, 24 references]

[Abstracter: L. Baldwin]

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ORGANIC COMPOSITION

MARINE PLANT PRODUCTS

<p>4.13 UNUSUAL OCCURRENCE OF SQUALENE IN A FISH, THE EULACHON <i>THALEICHTHYS PACIFICUS</i></p> <p>Ackman, R. G., R. P. Addison, and C. A. Eaton (Fisheries Research Board of Canada Halifax Laboratory, Halifax, Nova Scotia) <i>Nature</i> 220, No. 5171, 1033-1034 (December 7, 1968)</p> <p>The lipids from 16 pooled eulachon (<i>Thaleichthys pacificus</i>) caught in Barkley Sound, Vancouver Island, in May 1968 were investigated. The nonsaponifiable material included a large amount of oily matter that was identified as squalene, since its behavior was identical to that of authentic squalene on thin-layer and gas-liquid chromatography, it lacked significant absorption in the ultraviolet, it was susceptible to attacks by ozone, it resisted silylating reagents, and it quantitatively converted to squalene on hydrogenation. The authors know of no reason for the accumulation of squalene in the eulachon, though they suggest that the squalene could be derived from the hydrocarbons that occur in the zooplankton eaten by the fish and is probably a normal major component in eulachon lipids. [16 references]</p> <p>[Abstracter: L. Baldwin]</p>	<p>1.950 A LIST OF THE MARINE MAMMALS OF THE WORLD</p> <p>Rice, Dale W., and Victor B. Scheffer (Bureau of Commercial Fisheries Marine Mammal Biological Laboratory, Seattle, Washington 98115) <i>Special Scientific Report--Fisheries</i> No. 579, 16 pp. (December 1968) (Bureau of Commercial Fisheries, U.S. Fish and Wildlife Service, Washington, D.C. 20240)</p> <p>This list covers 117 species of living and recently extinct marine mammals, including the fresh-water species of predominantly marine groups. The number of species in each order treated is: Carnivora, 1; Pinnipedia, 33; Sirenia, 5; Mysticeti, 10; and Odontoceti, 68. The geographical distribution of each species, the vernacular name for most species, and the generic and specific synonyms that frequently appear in the literature are given. [94 references]</p> <p>[Abstracter: L. Baldwin]</p>
<p>3.5 NATURAL DESTRUCTION OF THE MYCOLOGICAL FLORA OF SALT</p> <p>Quinta, M. L. (Laboratory of Mycology, Instituto Nacional de Investigação Industrial, Lisbon, Portugal) <i>Food Technology</i> 22, No. 12, 103-105 (December 1968)</p> <p>The purpose of this study was to determine whether any natural sanitation of commercial salt occurred during aging. Forty-nine salt samples were tested: 10 from the market and 39 from saltpans in various areas in Portugal. The salt taken from the saltpans was analyzed soon after it was collected and again after 2 years' storage.</p> <p>Ascomycetes, Deuteromycetes, Mucorales, and yeasts were isolated from the salt; the Deuteromycetes were predominant. Osmotolerant strains that appeared macroscopically to be similar to <i>Sporendonema epizoum</i> were isolated. The latter is an agent for the "dun" color of salt codfish. A natural sanitation of salt appeared to occur with aging; the mycological content of the stored salt was lower than that of the originally produced salt. [5 tables, 19 references]</p> <p>[Abstracter: F. T. Piskur]</p>	<p>4.4 (Cross References: 1.80, 4.99)</p> <p>BIOCHEMISTRY OF SHELLFISH LIPIDS. IX - ENZYMATIC HYDROLYSIS OF CERAMIDE 2-AMINOETHYLPHOSPHONATE AND SPHINGOETHANOLAMINE</p> <p>Hori, Taro, Ikuko Arakawa, Mutsumi Sugita, and Osamu Itasaka (Department of Chemistry, Faculty of Liberal Arts and Education, Shiga University, Otsu, Shiga, Japan) <i>Journal of Biochemistry</i> 64, No. 4, 533-536 (October 1968)</p> <p>This paper reports studies on the hydrolysis of ceramide 2-aminoethylphosphonate (CAEP) and sphingoethanolamine (SEA), analogues of sphingomyelin, by phospholipase C from <i>Clostridium perfringens</i> (welchii). The following compounds were isolated and identified: (1) 2-aminoethylphosphonic acid (ciliatine) and ceramide produced from CAEP and phospholipase C and (2) phosphorylethanolamine and ceramide produced from SEA and phospholipase C. [3 figures, 7 references]</p> <p>[Abstracter: F. T. Piskur]</p>
<p>ORGANIC COMPOSITION</p> <p>SALT FISH</p>	<p>WHALES AND OTHER MARINE MAMMALS</p> <p>SPOILAGE</p>

8.59 (Cross References: 0.38, 9.1)

(*)
GENETIC VARIATION OF COD AND COALFISH
LACTATE DEHYDROGENASE

Lush, I. E., and C. B. Cowey (Natural Environment Research Council Fisheries Biochemical Research Unit, University of Aberdeen, Scotland)
Biochemical Journal 110, No. 3, 33P-34P (December 1968)

Polymorphism of one lactate dehydrogenase (LDH) polypeptide was demonstrated by starch-gel electrophoresis of the tissue (particularly the heart) extracts of cod (*Gadus morhua*). Further, the authors found in coalfish (*G. virens*) a polymorphism of a different LDH polypeptide, which occurred mainly in the skeletal muscle. The authors suggested that the polypeptide polymorphism of coalfish may provide suitable material for a detailed biochemical analysis of a genetic difference. [1 reference]

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9.11
(*)
PHYSICAL, CHEMICAL, AND BIOLOGICAL OCEANOGRAPHY
OF THE ENTRANCE TO THE GULF OF CALIFORNIA,
SPRING OF 1960

Griffiths, Raymond C. (Institute of Marine Resources, Scripps Institution of Oceanography, University of California, San Diego, La Jolla 92037)
Special Scientific Report--Fisheries No. 573, 47 pp. (December 1968) (Bureau of Commercial Fisheries, U.S. Fish and Wildlife Service, Washington, D.C. 20240)

Tuna are known to migrate seasonally across the Gulf of California and the waters off western Lower California. The purpose of this paper is to present and interpret data collected during cruises in 1960 by the Scripps Tuna Oceanography Research Program and in 1960 and 1961 by the California Cooperative Oceanic Fisheries Investigations. Specifically, it discusses the kinds of water in the mouth of the Gulf; the vertical and horizontal distribution of temperature, salinity, the thermocline anomaly, dissolved oxygen, and inorganic phosphorus; and, in addition, the horizontal distribution of surface currents, chlorophyll *a*, and zooplankton and micronekton. [40 figures, 20 references]

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[Abstracter: L. Baldwin]

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CHEMISTRY AND BIOCHEMISTRY
OCEANOGRAPHY

9.3 (Cross References: 1.01113, 2.118)

(*)
CHANGE OF "PROCESSING AT SEA" REGULATION
PONDERED BY B.C. [BRITISH COLUMBIA]

Anonymous
Western Fisheries 77, No. 3, 14 (December 1968)

A 30-year-old section of the B.C. Fisheries Act prohibits the processing of any type of fish at sea, including the manufacture of fish meal and oil, the filleting and packaging of groundfish, and the canning (or the preparation for canning) of salmon, shrimp, crab, or oysters. The prohibition is now being reviewed.

Arguments against licensing processing ships are much the same as those advanced in the past: shore-based cannery support substantial communities on shore, pay thousands of dollars in taxes, provide employment for thousands of seasonal workers, and are more subject to inspection and regulation than are cannery workers who can move about. Arguments for licensing the ships point to the need for instituting more efficient operating practices and for improving quality, the concentration of plants in areas far from the fishing grounds, and the competitive pressures from foreign fishing fleets and processing ships.

[Abstracter: L. Baldwin]

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9.6
(*)
IN THE WAKE OF THE TORREY CANYON

Carthy, J. D., and Don R. Arthur (Eds.)

The Biological Effects of Oil Pollution on Littoral Communities (Proceedings of a symposium, Pembroke, Wales, February 1968) (Field Studies Council, London, England [1968]), 198 pp., 45 s. (Distributor: Classey, Hampton, Middlesex, England)

Reviewed by Paul G. Galtsoff (U.S. Fish and Wildlife Service, Woods Hole, Massachusetts)

Science 162, No. 3860, 1377 (December 20, 1968)

This work is an extension of the short-term studies made by the staff of the Plymouth Laboratory following the Torrey Canyon disaster in March 1967. It contains 18 articles by various authors on the effects of crude oil on plant and animal communities, on the chemistry of oil and detergents used to combat pollution, on the role of bacteria in degradation of oil in the sea, and on the pathological consequences to birds poisoned by oil.

[Abstracter: L. Baldwin]

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COMMERCIAL FISHERIES ABSTRACTS VOL. 22, NO. 4, PAGE 25
UNITED STATES DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE

REGULATION AND INSPECTION
POLLUTION

9.11 (Cross Reference: 1.0112)

OCEANOGRAPHIC SURVEYS OF TRAITORS COVE
REVILLAGIGEDO ISLAND, ALASKA

McLain, Douglas R. (Bureau of Commercial Fisheries Biological Laboratory, Box 155, Auke Bay, Alaska 99821)
Special Scientific Report--Fisheries No. 576, 15 pp. (December 1968) (Bureau of Commercial Fisheries, U.S. Fish and Wildlife Service, Washington, D.C. 20240)

In the spring when juvenile salmon first enter salt water, they begin one of the most critical periods in their life cycle, for it is during these first few weeks that a large part of the total ocean mortality probably occurs. Relatively little is known of the oceanography of the salt-water areas in Southeastern Alaska where this mortality takes place. This paper describes a study of water temperatures, water chemistry, and surface currents in such an area.

Traitors Cove, a small fiordlike estuary in Southeastern Alaska, is divided into two basins by a narrow constriction. Because of the wide range of tides in the area and the limited capacity of the constriction to permit their flow in volume, reversing tidal falls form at the constriction. Oceanographic surveys of the estuary have showed that these falls create a region of strong turbulence and destroy the stratification of the water near it. Surface currents in the estuary are predominantly seaward at ebb tide and landward at flood tide. The scale and the effect of these oceanographic features are discussed.

[2 tables, 15 figures, 12 references] [Abstracter: L. Baldwin]

9.125

LENGTH RELATIONS OF SOME MARINE FISHES FROM COASTAL GEORGIA

Jorgenson, Sherrell C., and Grant L. Miller (Bureau of Commercial Fisheries Biological Laboratory, Brunswick, Georgia 31520)
Special Scientific Report--Fisheries No. 575, 16 pp. (November 1968) (Bureau of Commercial Fisheries, U.S. Fish and Wildlife Service, Washington, D.C. 20240)

Information about growth and changes in the body form of fishes during their development usually refers to length as "standard," "fork," or "total." Comparison of these lengths is difficult or impossible without some means of converting one to another. The authors determined the relations of standard, fork, and total length by the method of least squares. The statistics that describe these relations for 82 marine species are presented in this paper, and factors are given for converting one length measurement to another. [3 tables]

[Abstracter: L. Baldwin]

OCEANOGRAPHY

ICHTHYOLOGY

9.6 (Cross References: 0.3, 4.0)

ANNUAL REPORT OF THE HORMEL INSTITUTE, 1965-1966

Anonymous
University of Minnesota, The Hormel Institute, Annual Report, 1965-1966, 29 pp. (n.d.)

This report includes abstracts of 41 papers published by this Institute in the years covered by the report plus a more complete listing of all publications published by the staff. Although only two of the publications deal directly with fish, a majority of them are on general topics of interest to workers in the fields of the chemistry, metabolism, and nutritive value of fish oils. A brief description of facilities and of research aims, activities, and staff of the Institute is also included.

[Abstracter: M. E. Stansby]

9.3 (Cross References: 1.0113, 2.118)

THE CASE FOR FLOATING PROCESSING PLANTS

James, Art (Sechelt Fishery, Sechelt, British Columbia, Canada)
Western Fisheries 77, No. 3, 15, 40-41 (December 1968)

This article is a plant owner's reply to the B.C. [British Columbia] government's request for comments on the possibility of licensing floating fish-processing plants. He says, without qualification, that the floating plants should be licensed, adding that mere partial repeal of the prohibitory section would be intolerable. He emphasizes the deleterious effects of time on the quality of fish, tracing the inordinate number of days it takes the Canadian fisherman to get his catch through the fish-buying camps and to the processor. And he advances poor quality as the reason Canadian citizens don't eat more products made from Pacific coast fish. He concludes by pointing out some of the types of shipboard processing that would help solve the consumers' problem. [Abstracter: L. Baldwin]

NUTRITION OF OILS

REGULATION AND INSPECTION

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